Name: Date:

Polynomial Factoring solution (version 1)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 37 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(37)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 148}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-48}}{2}$$

$$x = \frac{10 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{10 \pm 4\sqrt{3}\,i}{2}$$

$$x = 5 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-4 + 9i$ and $2 + 6i$ in standard form $(a + bi)$.**

Solution

$$(-4 + 9i) \cdot (2 + 6i)$$

$$-8 - 24i + 18i + 54i^2$$

$$-8 - 24i + 18i - 54$$

$$-8 - 54 - 24i + 18i$$

$$-62 - 6i$$

Polynomial Factoring solution (version 1)

3. **Write function $f(x) = x^3 - 8x^2 + 19x - 12$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-8	19	-12
4		4	-16	12
	1	-4	3	0

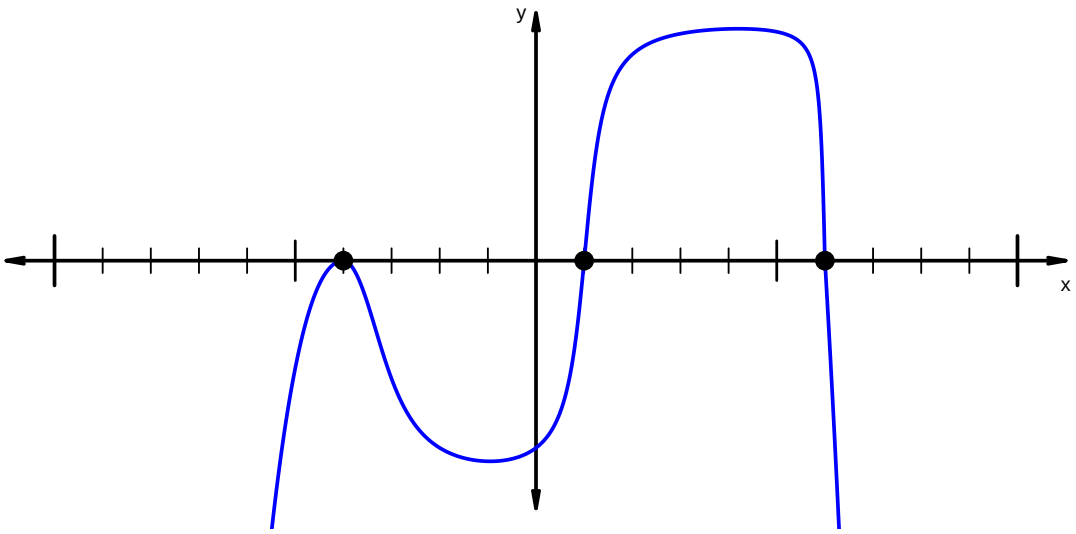
$$f(x) = (x-4)(x^2 - 4x + 3)$$

$$f(x) = (x-4)(x-1)(x-3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x-1) \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 2)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 14 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(14)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 56}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-52}}{2}$$

$$x = \frac{-2 \pm \sqrt{-4 \cdot 13}}{2}$$

$$x = \frac{-2 \pm 2\sqrt{13}\, i}{2}$$

$$x = -1 \pm \sqrt{13}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 - 6i$ and $9 - 5i$ in standard form $(a + bi)$.**

Solution

$$(-2 - 6i) \cdot (9 - 5i)$$

$$-18 + 10i - 54i + 30i^2$$

$$-18 + 10i - 54i - 30$$

$$-18 - 30 + 10i - 54i$$

$$-48 - 44i$$

Polynomial Factoring solution (version 2)

3. **Write function $f(x) = x^3 + 11x^2 + 34x + 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	11	34	24
-6		-6	-30	-24
	1	5	4	0

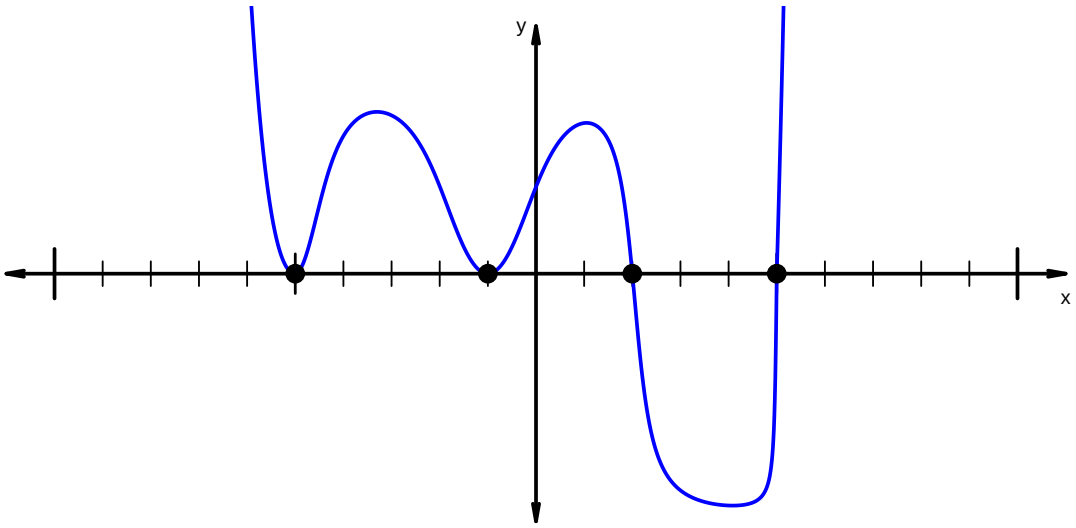
$$f(x) = (x+6)(x^2+5x+4)$$

$$f(x) = (x+6)(x+4)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)^2 \cdot (x+1)^2 \cdot (x-2) \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 3)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 16 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(16)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 64}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-48}}{2}$$

$$x = \frac{4 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{4 \pm 4\sqrt{3}\,i}{2}$$

$$x = 2 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 + 7i$ and $3 + 2i$ in standard form $(a + bi)$.**

Solution

$$(9 + 7i) \cdot (3 + 2i)$$

$$27 + 18i + 21i + 14i^2$$

$$27 + 18i + 21i - 14$$

$$27 - 14 + 18i + 21i$$

$$13 + 39i$$

Polynomial Factoring solution (version 3)

3. **Write function $f(x) = x^3 + 3x^2 - 6x - 8$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	3	-6	-8
-4		-4	4	8
	1	-1	-2	0

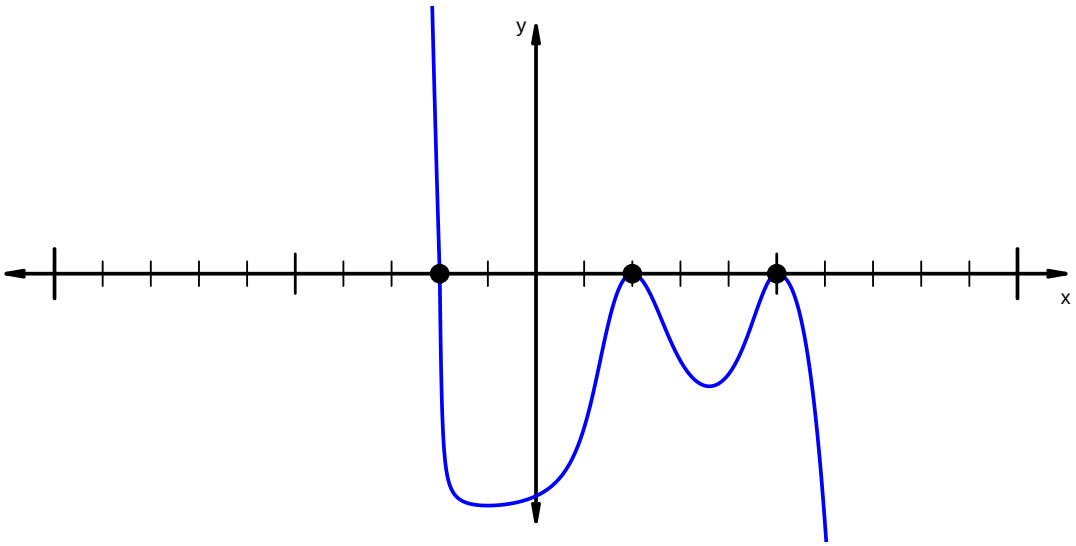
$$f(x) = (x+4)(x^2 - x - 2)$$

$$f(x) = (x+4)(x+1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+2) \cdot (x-2)^2 \cdot (x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 4)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 36 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 144}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-80}}{2}$$

$$x = \frac{-8 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-8 \pm 4\sqrt{5}\, i}{2}$$

$$x = -4 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 6i$ and $3 + 4i$ in standard form $(a + bi)$.**

Solution

$$(7 + 6i) \cdot (3 + 4i)$$

$$21 + 28i + 18i + 24i^2$$

$$21 + 28i + 18i - 24$$

$$21 - 24 + 28i + 18i$$

$$-3 + 46i$$

Polynomial Factoring solution (version 4)

3. **Write function $f(x) = x^3 + 9x^2 + 8x - 60$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	9	8	-60
-5		-5	-20	60
	1	4	-12	0

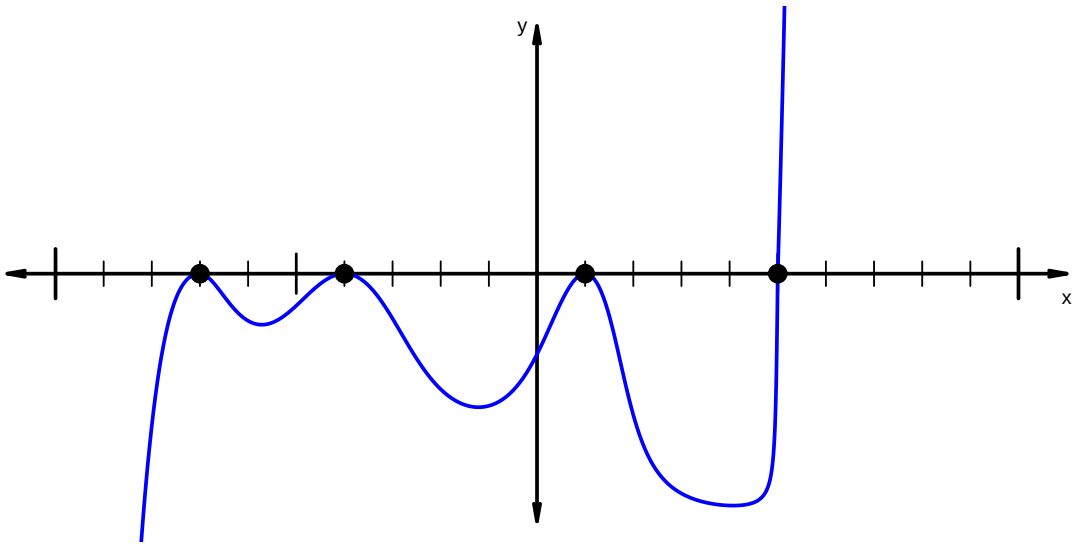
$$f(x) = (x + 5)(x^2 + 4x - 12)$$

$$f(x) = (x + 5)(x - 2)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 7)^2 \cdot (x + 4)^2 \cdot (x - 1)^2 \cdot (x - 5)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 5)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 15 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(15)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 60}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-44}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4 \cdot 11}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{11}\, i}{2}$$

$$x = -2 \pm \sqrt{11}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $3 + 6i$ and $-4 + 2i$ in standard form $(a + bi)$.**

Solution

$$(3 + 6i) \cdot (-4 + 2i)$$

$$-12 + 6i - 24i + 12i^2$$

$$-12 + 6i - 24i - 12$$

$$-12 - 12 + 6i - 24i$$

$$-24 - 18i$$

Polynomial Factoring solution (version 5)

3. **Write function $f(x) = x^3 - 7x^2 + 2x + 40$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	-7	2	40
-2		-2	18	-40
	1	-9	20	0

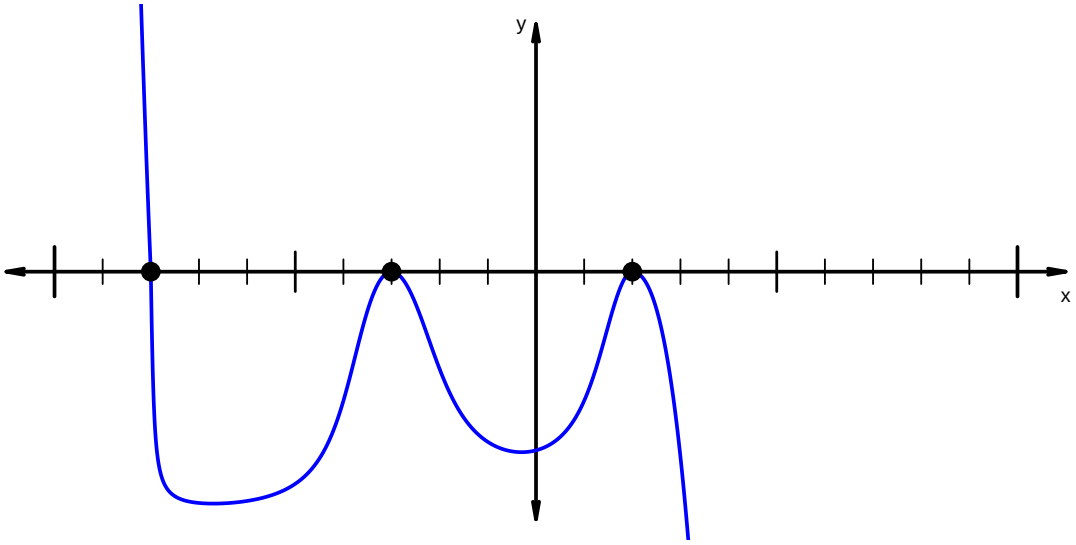
$$f(x) = (x + 2)(x^2 - 9x + 20)$$

$$f(x) = (x + 2)(x - 4)(x - 5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 8) \cdot (x + 3)^2 \cdot (x - 2)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 6)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 17 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(17)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 68}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-52}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4 \cdot 13}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{13}\, i}{2}$$

$$x = -2 \pm \sqrt{13}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $5 + 9i$ and $4 + 2i$ in standard form $(a + bi)$.**

Solution

$$(5 + 9i) \cdot (4 + 2i)$$

$$20 + 10i + 36i + 18i^2$$

$$20 + 10i + 36i - 18$$

$$20 - 18 + 10i + 36i$$

$$2 + 46i$$

Polynomial Factoring solution (version 6)

3. **Write function $f(x) = x^3 + x^2 - 22x - 40$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	1	-22	-40
5		5	30	40
	1	6	8	0

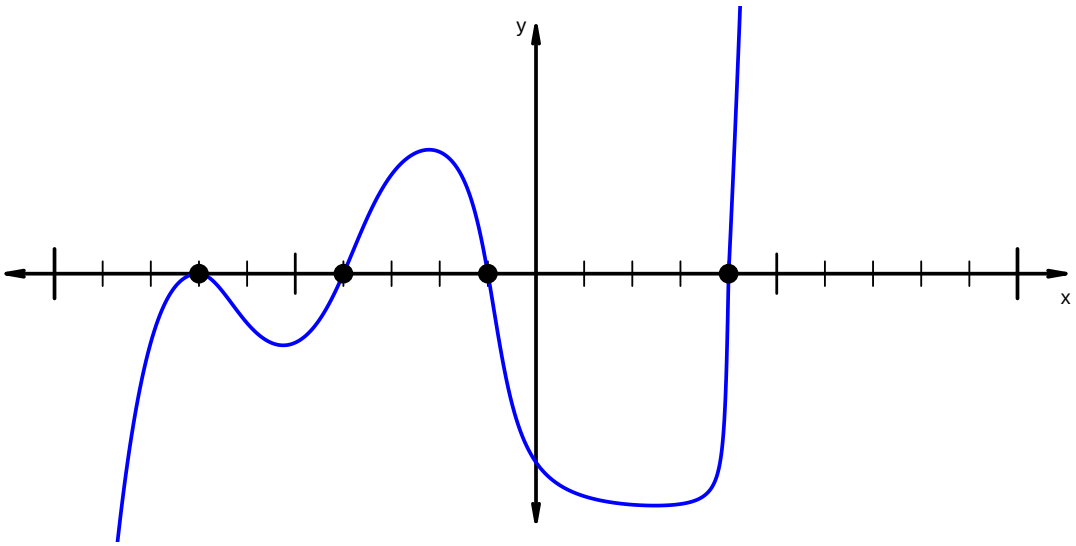
$$f(x) = (x-5)(x^2+6x+8)$$

$$f(x) = (x-5)(x+4)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+4) \cdot (x+1) \cdot (x-4)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 7)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 30 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(30)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 120}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-20}}{2}$$

$$x = \frac{10 \pm \sqrt{-4 \cdot 5}}{2}$$

$$x = \frac{10 \pm 2\sqrt{5}\, i}{2}$$

$$x = 5 \pm \sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-5 + 3i$ and $-7 + 4i$ in standard form $(a + bi)$.**

Solution

$$(-5 + 3i) \cdot (-7 + 4i)$$

$$35 - 20i - 21i + 12i^2$$

$$35 - 20i - 21i - 12$$

$$35 - 12 - 20i - 21i$$

$$23 - 41i$$

Polynomial Factoring solution (version 7)

3. **Write function $f(x) = x^3 + 2x^2 - 5x - 6$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	2	-5	-6
-3		-3	3	6
	1	-1	-2	0

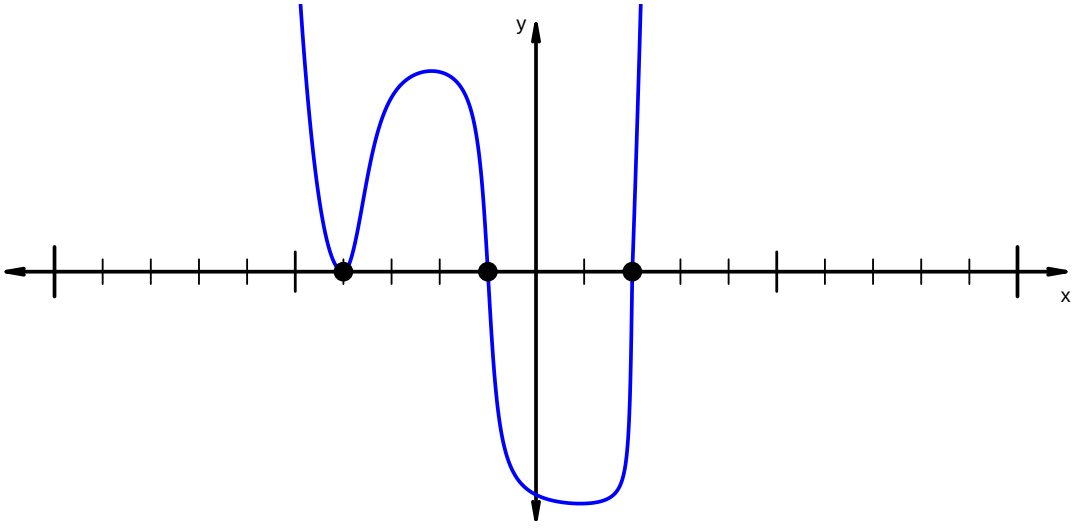
$$f(x) = (x+3)(x^2 - x - 2)$$

$$f(x) = (x+3)(x+1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+4)^2 \cdot (x+1) \cdot (x-2)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 8)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 84}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-48}}{2}$$

$$x = \frac{-6 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{-6 \pm 4\sqrt{3}\, i}{2}$$

$$x = -3 \pm 2\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 9i$ and $5 - 4i$ in standard form $(a + bi)$.**

Solution

$$(7 + 9i) \cdot (5 - 4i)$$

$$35 - 28i + 45i - 36i^2$$

$$35 - 28i + 45i + 36$$

$$35 + 36 - 28i + 45i$$

$$71 + 17i$$

Polynomial Factoring solution (version 8)

3. **Write function $f(x) = x^3 - 6x^2 + 11x - 6$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	-6	11	-6
3		3	-9	6
	1	-3	2	0

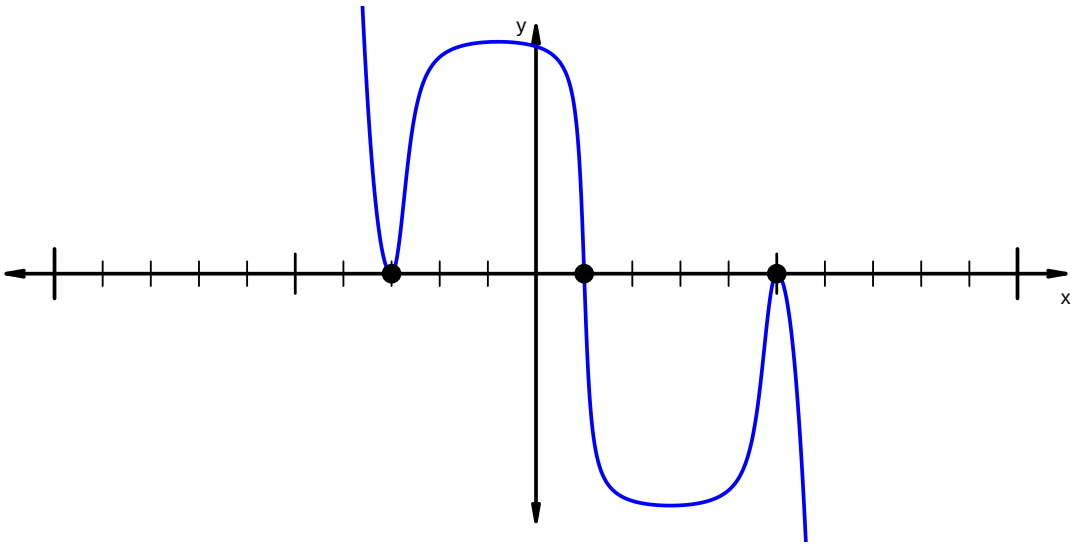
$$f(x) = (x-3)(x^2 - 3x + 2)$$

$$f(x) = (x-3)(x-1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+3)^2 \cdot (x-1) \cdot (x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 9)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 50 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(50)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 200}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-56}}{2}$$

$$x = \frac{12 \pm \sqrt{-4 \cdot 14}}{2}$$

$$x = \frac{12 \pm 2\sqrt{14}\, i}{2}$$

$$x = 6 \pm \sqrt{14}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 2i$ and $-8 + 6i$ in standard form $(a + bi)$.**

Solution

$$(7 + 2i) \cdot (-8 + 6i)$$

$$-56 + 42i - 16i + 12i^2$$

$$-56 + 42i - 16i - 12$$

$$-56 - 12 + 42i - 16i$$

$$-68 + 26i$$

Polynomial Factoring solution (version 9)

3. **Write function $f(x) = x^3 + 7x^2 + 14x + 8$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	7	14	8
-4		-4	-12	-8
	1	3	2	0

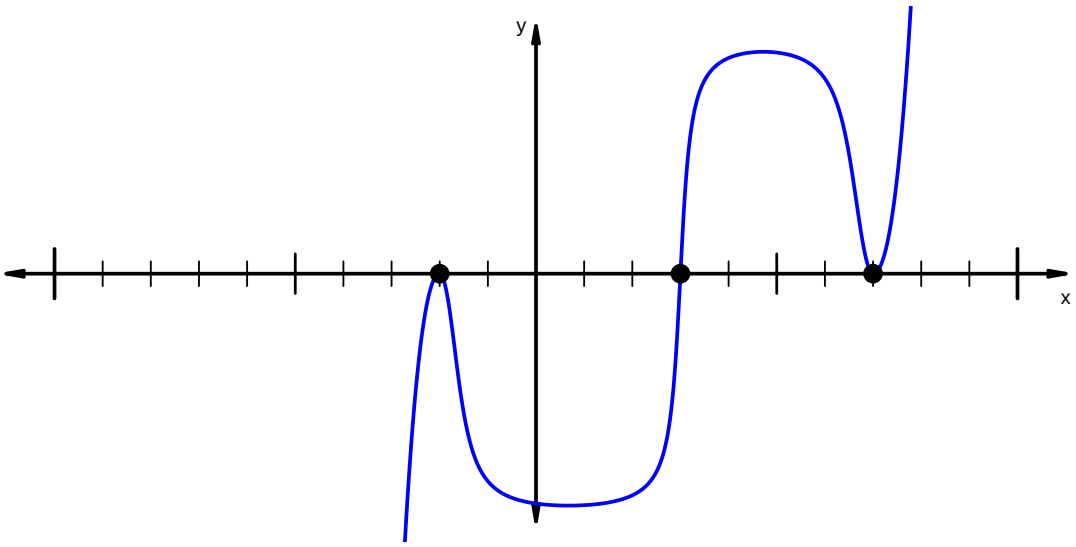
$$f(x) = (x + 4)(x^2 + 3x + 2)$$

$$f(x) = (x + 4)(x + 1)(x + 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 2)^2 \cdot (x - 3) \cdot (x - 7)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 10)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 84}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-80}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{5}\, i}{2}$$

$$x = -1 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-6 + 2i$ and $-5 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-6 + 2i) \cdot (-5 + 3i)$$

$$30 - 18i - 10i + 6i^2$$

$$30 - 18i - 10i - 6$$

$$30 - 6 - 18i - 10i$$

$$24 - 28i$$

Polynomial Factoring solution (version 10)

3. **Write function $f(x) = x^3 + x^2 - 26x + 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	1	-26	24
-6		-6	30	-24
	1	-5	4	0

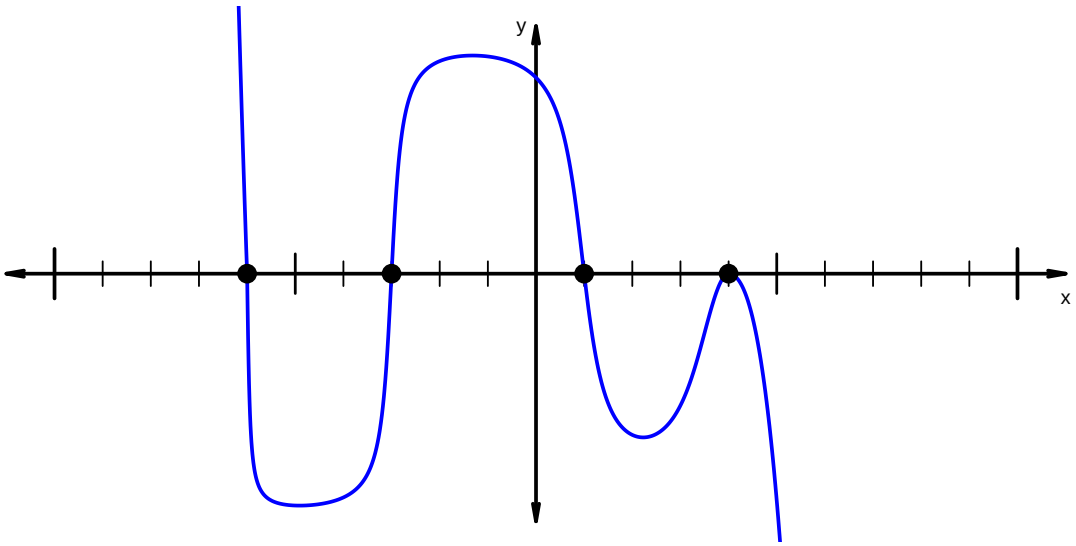
$$f(x) = (x+6)(x^2 - 5x + 4)$$

$$f(x) = (x+6)(x-1)(x-4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+6) \cdot (x+3) \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 11)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 6x + 27 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(27)}}{2(1)}$$

$$x = \frac{-(-6) \pm \sqrt{36 - 108}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-72}}{2}$$

$$x = \frac{6 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{6 \pm 6\sqrt{2}\, i}{2}$$

$$x = 3 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 - 7i$ and $-6 - 4i$ in standard form $(a + bi)$.**

Solution

$$(-8 - 7i) \cdot (-6 - 4i)$$

$$48 + 32i + 42i + 28i^2$$

$$48 + 32i + 42i - 28$$

$$48 - 28 + 32i + 42i$$

$$20 + 74i$$

Polynomial Factoring solution (version 11)

3. **Write function $f(x) = x^3 + 9x^2 + 8x - 60$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	9	8	-60
-5		-5	-20	60
	1	4	-12	0

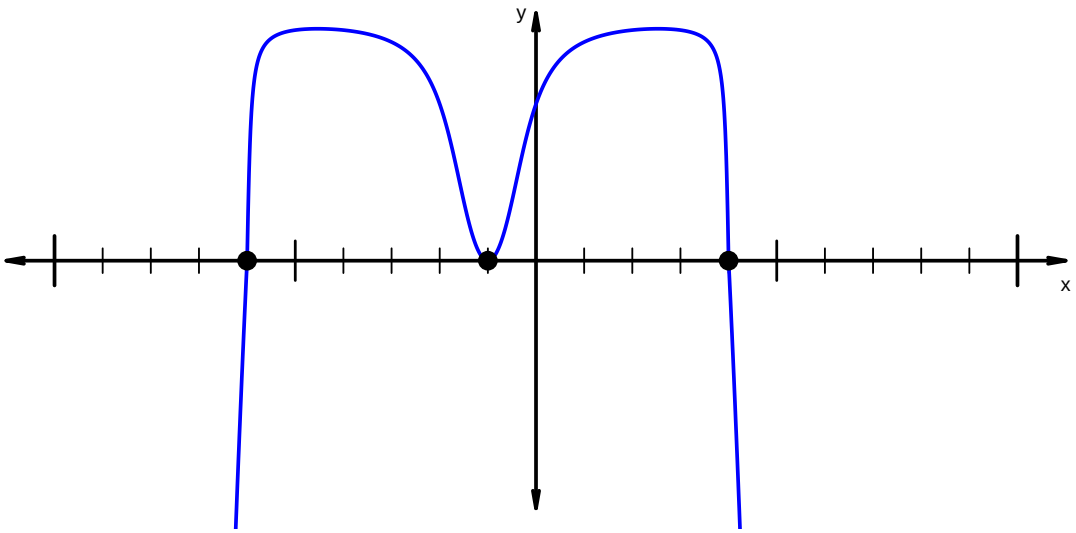
$$f(x) = (x + 5)(x^2 + 4x - 12)$$

$$f(x) = (x + 5)(x + 6)(x - 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 6) \cdot (x + 1)^2 \cdot (x - 4)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 12)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 31 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(31)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 124}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-108}}{2}$$

$$x = \frac{-4 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{-4 \pm 6\sqrt{3}\, i}{2}$$

$$x = -2 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 - 4i$ and $3 + 6i$ in standard form $(a + bi)$.**

Solution

$$(9 - 4i) \cdot (3 + 6i)$$

$$27 + 54i - 12i - 24i^2$$

$$27 + 54i - 12i + 24$$

$$27 + 24 + 54i - 12i$$

$$51 + 42i$$

Polynomial Factoring solution (version 12)

3. **Write function $f(x) = x^3 - 11x^2 + 34x - 24$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-11	34	-24
4		4	-28	24
	1	-7	6	0

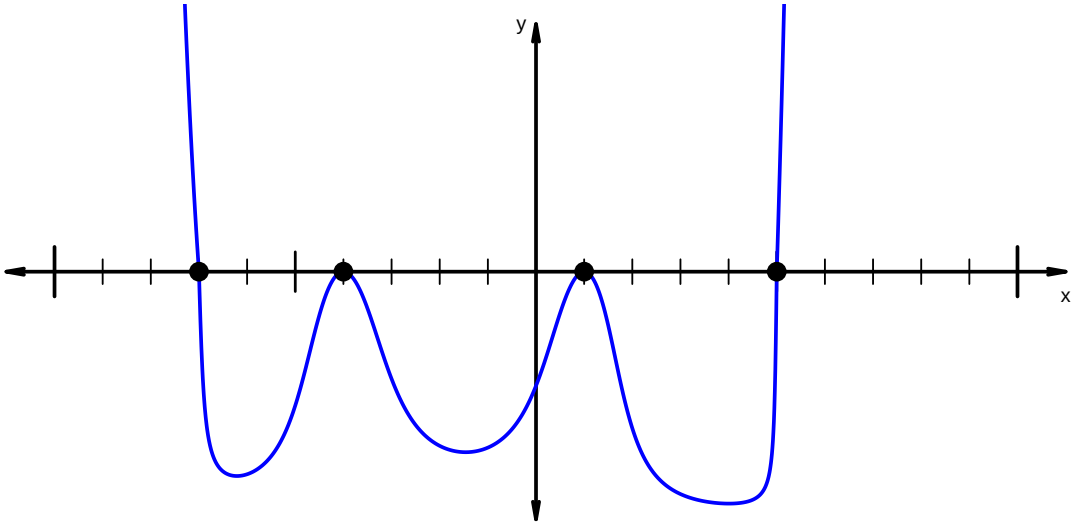
$$f(x) = (x-4)(x^2 - 7x + 6)$$

$$f(x) = (x-4)(x-6)(x-1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7) \cdot (x+4)^2 \cdot (x-1)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 13)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 22 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(22)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 88}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-72}}{2}$$

$$x = \frac{4 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{4 \pm 6\sqrt{2}\, i}{2}$$

$$x = 2 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $5 - 2i$ and $4 - 9i$ in standard form $(a + bi)$.**

Solution

$$(5 - 2i) \cdot (4 - 9i)$$

$$20 - 45i - 8i + 18i^2$$

$$20 - 45i - 8i - 18$$

$$20 - 18 - 45i - 8i$$

$$2 - 53i$$

Polynomial Factoring solution (version 13)

3. **Write function $f(x) = x^3 + x^2 - 22x - 40$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	1	-22	-40
-2		-2	2	40
	1	-1	-20	0

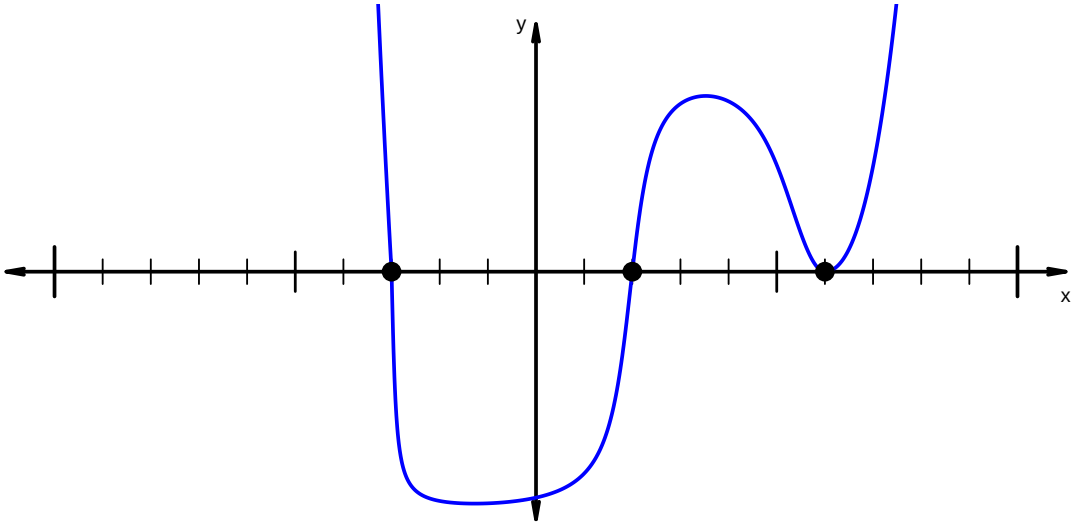
$$f(x) = (x + 2)(x^2 - x - 20)$$

$$f(x) = (x + 2)(x + 4)(x - 5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 3) \cdot (x - 2) \cdot (x - 6)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 14)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 6x + 33 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(-6) \pm \sqrt{36 - 132}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-96}}{2}$$

$$x = \frac{6 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{6 \pm 4\sqrt{6}\, i}{2}$$

$$x = 3 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $4 - 7i$ and $-8 - 5i$ in standard form $(a + bi)$.**

Solution

$$(4 - 7i) \cdot (-8 - 5i)$$

$$-32 - 20i + 56i + 35i^2$$

$$-32 - 20i + 56i - 35$$

$$-32 - 35 - 20i + 56i$$

$$-67 + 36i$$

Polynomial Factoring solution (version 14)

3. **Write function $f(x) = x^3 + x^2 - 26x + 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	1	-26	24
-6		-6	30	-24
	1	-5	4	0

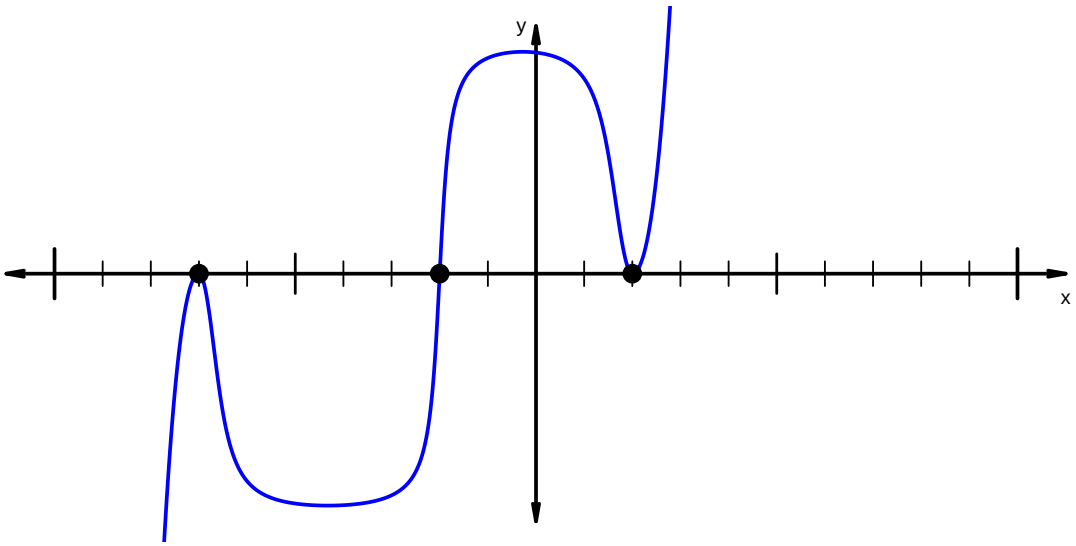
$$f(x) = (x + 6)(x^2 - 5x + 4)$$

$$f(x) = (x + 6)(x - 4)(x - 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 7)^2 \cdot (x + 2) \cdot (x - 2)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 15)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 60 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(60)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 240}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-96}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{12 \pm 4\sqrt{6}\, i}{2}$$

$$x = 6 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-7 - 2i$ and $5 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-7 - 2i) \cdot (5 - 6i)$$

$$-35 + 42i - 10i + 12i^2$$

$$-35 + 42i - 10i - 12$$

$$-35 - 12 + 42i - 10i$$

$$-47 + 32i$$

Polynomial Factoring solution (version 15)

3. **Write function $f(x) = x^3 - 8x^2 + 4x + 48$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-8	4	48
4		4	-16	-48
	1	-4	-12	0

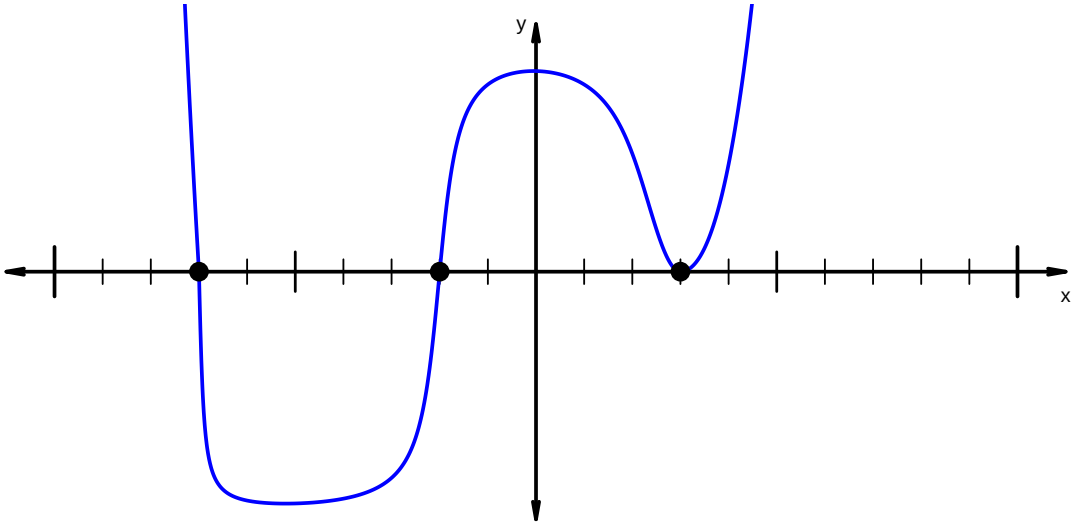
$$f(x) = (x-4)(x^2 - 4x - 12)$$

$$f(x) = (x-4)(x-6)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7) \cdot (x+2) \cdot (x-3)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 16)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 33 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 132}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-96}}{2}$$

$$x = \frac{-6 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-6 \pm 4\sqrt{6}\, i}{2}$$

$$x = -3 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 + 2i$ and $-6 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-9 + 2i) \cdot (-6 + 3i)$$

$$54 - 27i - 12i + 6i^2$$

$$54 - 27i - 12i - 6$$

$$54 - 6 - 27i - 12i$$

$$48 - 39i$$

Polynomial Factoring solution (version 16)

3. **Write function $f(x) = x^3 + 2x^2 - 11x - 12$ in factored form. I'll give you a hint: one factor is $(x + 1)$.**

Solution

	1	2	-11	-12
-1		-1	-1	12
	1	1	-12	0

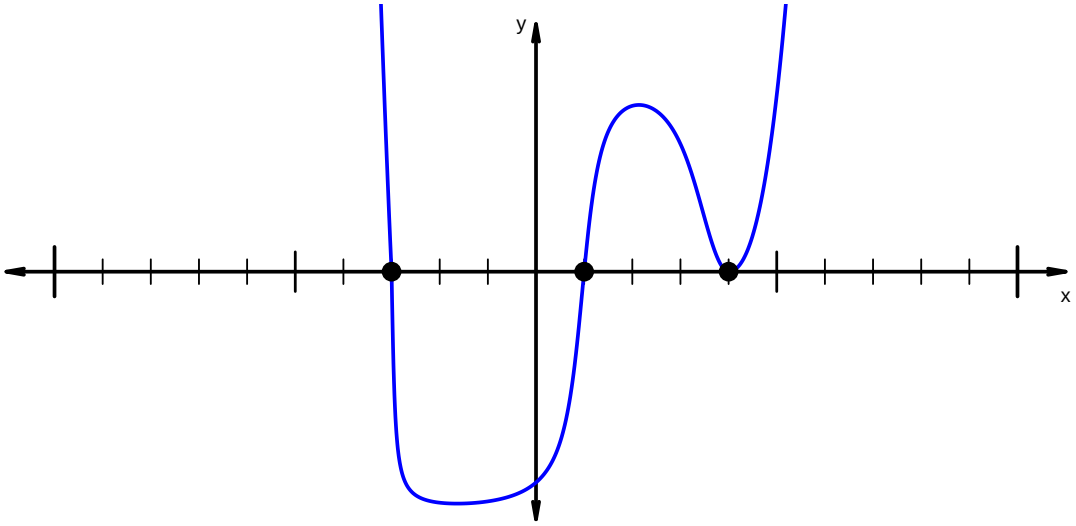
$$f(x) = (x+1)(x^2 + x - 12)$$

$$f(x) = (x+1)(x-3)(x+4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+3) \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 17)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 27 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(27)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 108}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-8}}{2}$$

$$x = \frac{-10 \pm \sqrt{-4 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{2}\, i}{2}$$

$$x = -5 \pm \sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 - 5i$ and $-6 + 3i$ in standard form $(a + bi)$.**

Solution

$$(7 - 5i) \cdot (-6 + 3i)$$

$$-42 + 21i + 30i - 15i^2$$

$$-42 + 21i + 30i + 15$$

$$-42 + 15 + 21i + 30i$$

$$-27 + 51i$$

Polynomial Factoring solution (version 17)

3. **Write function $f(x) = x^3 + 3x^2 - 22x - 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	3	-22	-24
-6		-6	18	24
	1	-3	-4	0

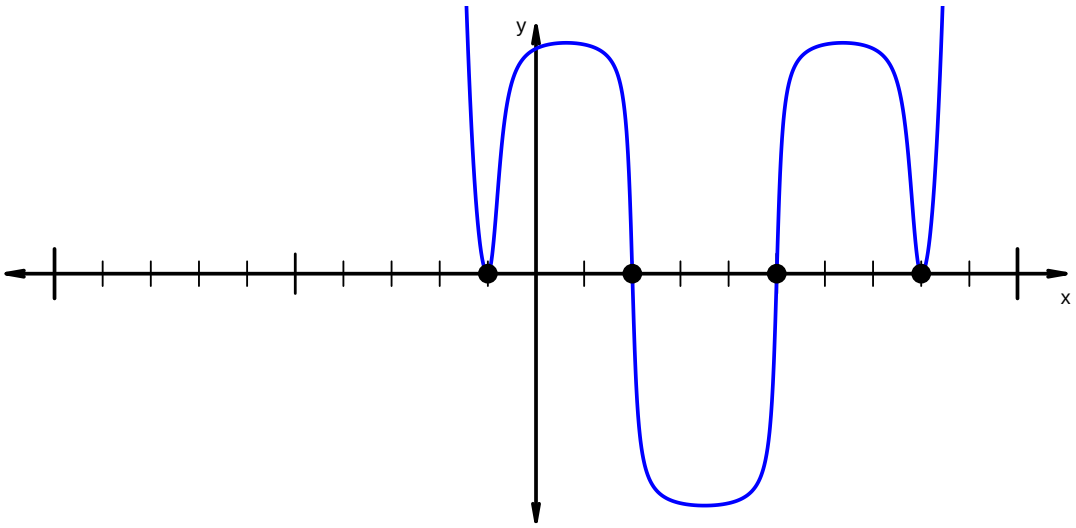
$$f(x) = (x+6)(x^2 - 3x - 4)$$

$$f(x) = (x+6)(x-4)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+1)^2 \cdot (x-2) \cdot (x-5) \cdot (x-8)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 18)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 96}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-32}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{8 \pm 4\sqrt{2}\, i}{2}$$

$$x = 4 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 - 5i$ and $3 - 2i$ in standard form $(a + bi)$.**

Solution

$$(9 - 5i) \cdot (3 - 2i)$$

$$27 - 18i - 15i + 10i^2$$

$$27 - 18i - 15i - 10$$

$$27 - 10 - 18i - 15i$$

$$17 - 33i$$

Polynomial Factoring solution (version 18)

3. **Write function $f(x) = x^3 - 8x^2 + 9x + 18$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-8	9	18
6		6	-12	-18
	1	-2	-3	0

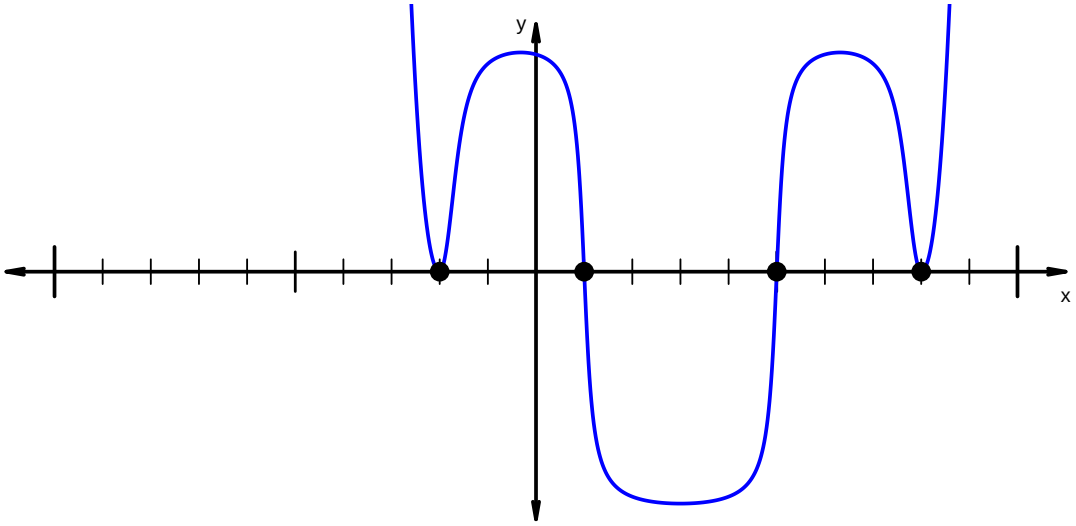
$$f(x) = (x-6)(x^2 - 2x - 3)$$

$$f(x) = (x-6)(x-3)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-1) \cdot (x-5) \cdot (x-8)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 19)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 36 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 144}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-80}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{8 \pm 4\sqrt{5}\, i}{2}$$

$$x = 4 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 7i$ and $5 + 4i$ in standard form ($a + bi$).**

Solution

$$(6 + 7i) \cdot (5 + 4i)$$

$$30 + 24i + 35i + 28i^2$$

$$30 + 24i + 35i - 28$$

$$30 - 28 + 24i + 35i$$

$$2 + 59i$$

Polynomial Factoring solution (version 19)

3. **Write function $f(x) = x^3 + 2x^2 - 23x - 60$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	2	-23	-60
5		5	35	60
	1	7	12	0

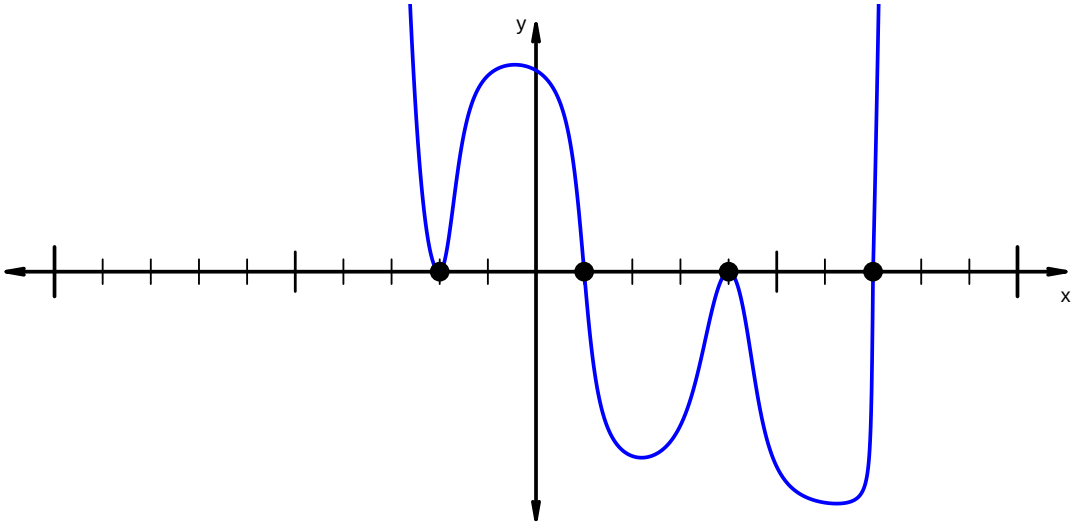
$$f(x) = (x-5)(x^2+7x+12)$$

$$f(x) = (x-5)(x+4)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-1) \cdot (x-4)^2 \cdot (x-7)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 20)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 112}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-12}}{2}$$

$$x = \frac{-10 \pm \sqrt{-4 \cdot 3}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{3}\, i}{2}$$

$$x = -5 \pm \sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 9i$ and $-7 - 5i$ in standard form $(a + bi)$.**

Solution

$$(2 - 9i) \cdot (-7 - 5i)$$

$$-14 - 10i + 63i + 45i^2$$

$$-14 - 10i + 63i - 45$$

$$-14 - 45 - 10i + 63i$$

$$-59 + 53i$$

Polynomial Factoring solution (version 20)

3. **Write function $f(x) = x^3 + 3x^2 - 13x - 15$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	3	-13	-15
-5		-5	10	15
	1	-2	-3	0

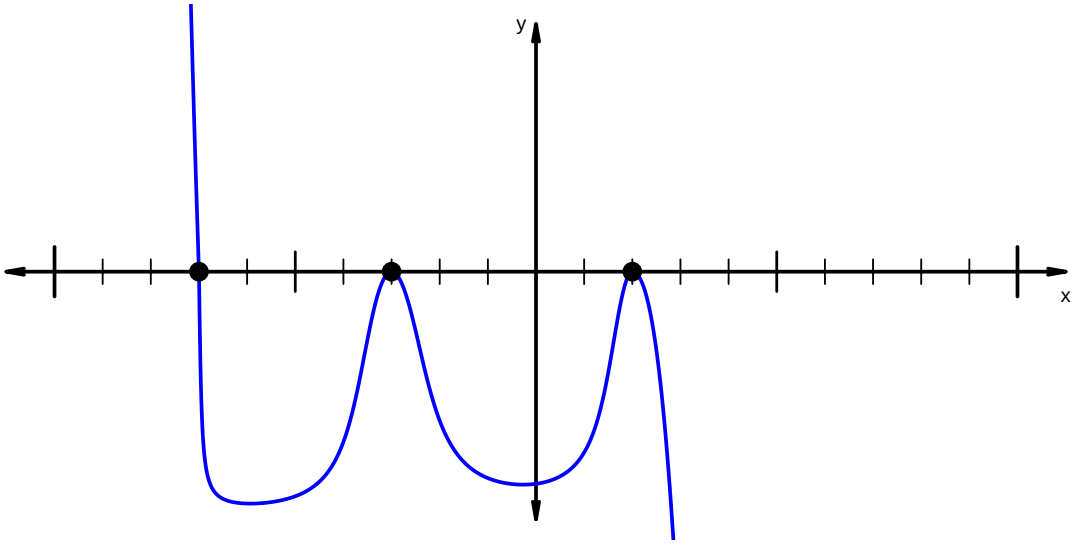
$$f(x) = (x + 5)(x^2 - 2x - 3)$$

$$f(x) = (x + 5)(x - 3)(x + 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 7) \cdot (x + 3)^2 \cdot (x - 2)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 21)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 23 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(23)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 92}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-28}}{2}$$

$$x = \frac{8 \pm \sqrt{-4 \cdot 7}}{2}$$

$$x = \frac{8 \pm 2\sqrt{7}\,i}{2}$$

$$x = 4 \pm \sqrt{7}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $4 + 9i$ and $5 + 3i$ in standard form ($a + bi$).**

Solution

$$(4 + 9i) \cdot (5 + 3i)$$

$$20 + 12i + 45i + 27i^2$$

$$20 + 12i + 45i - 27$$

$$20 - 27 + 12i + 45i$$

$$-7 + 57i$$

Polynomial Factoring solution (version 21)

3. **Write function $f(x) = x^3 + 4x^2 - 25x - 100$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	4	-25	-100
5		5	45	100
	1	9	20	0

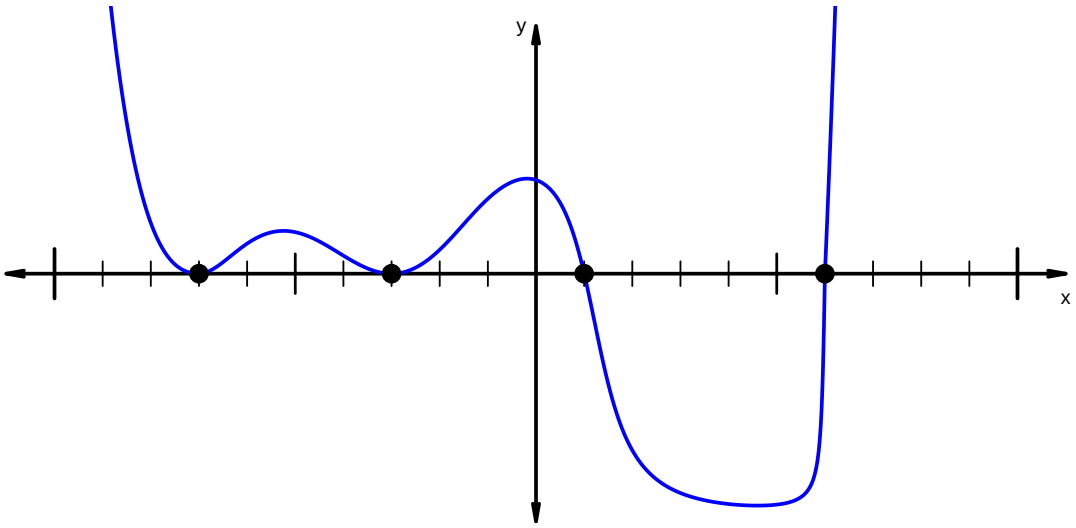
$$f(x) = (x-5)(x^2+9x+20)$$

$$f(x) = (x-5)(x+5)(x+4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+3)^2 \cdot (x-1) \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 22)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 96}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-32}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{8 \pm 4\sqrt{2}\, i}{2}$$

$$x = 4 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 4i$ and $8 + 5i$ in standard form $(a + bi)$.**

Solution

$$(6 + 4i) \cdot (8 + 5i)$$

$$48 + 30i + 32i + 20i^2$$

$$48 + 30i + 32i - 20$$

$$48 - 20 + 30i + 32i$$

$$28 + 62i$$

Polynomial Factoring solution (version 22)

3. **Write function $f(x) = x^3 + 10x^2 + 27x + 18$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	10	27	18
-3		-3	-21	-18
	1	7	6	0

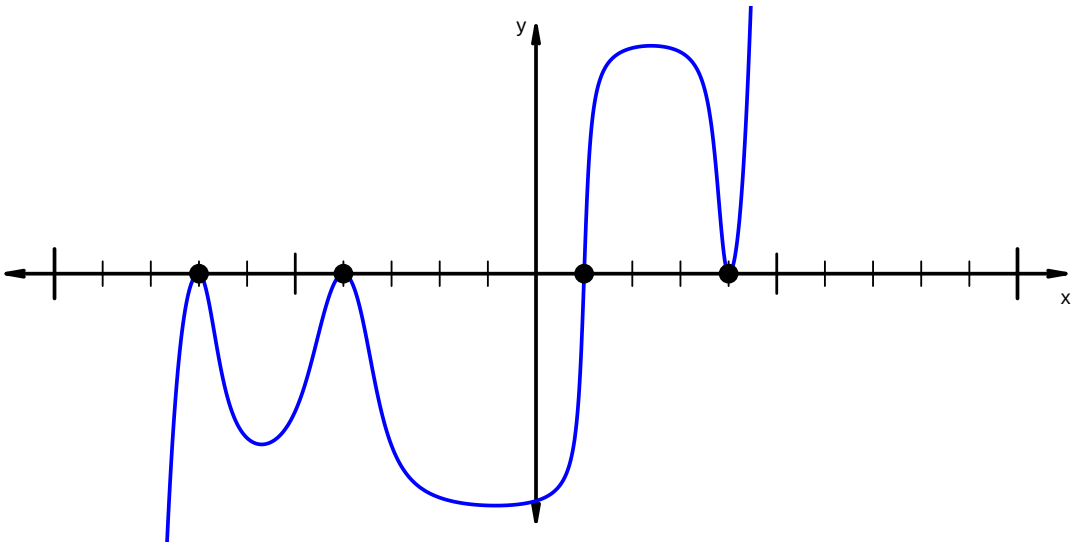
$$f(x) = (x+3)(x^2+7x+6)$$

$$f(x) = (x+3)(x+6)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+4)^2 \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 23)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 33 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 132}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-32}}{2}$$

$$x = \frac{-10 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 4\sqrt{2}\, i}{2}$$

$$x = -5 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 + 6i$ and $2 - 5i$ in standard form $(a + bi)$.**

Solution

$$(-8 + 6i) \cdot (2 - 5i)$$

$$-16 + 40i + 12i - 30i^2$$

$$-16 + 40i + 12i + 30$$

$$-16 + 30 + 40i + 12i$$

$$14 + 52i$$

Polynomial Factoring solution (version 23)

3. **Write function $f(x) = x^3 - 8x^2 + 11x + 20$ in factored form. I'll give you a hint: one factor is $(x + 1)$.**

Solution

	1	-8	11	20
-1		-1	9	-20
	1	-9	20	0

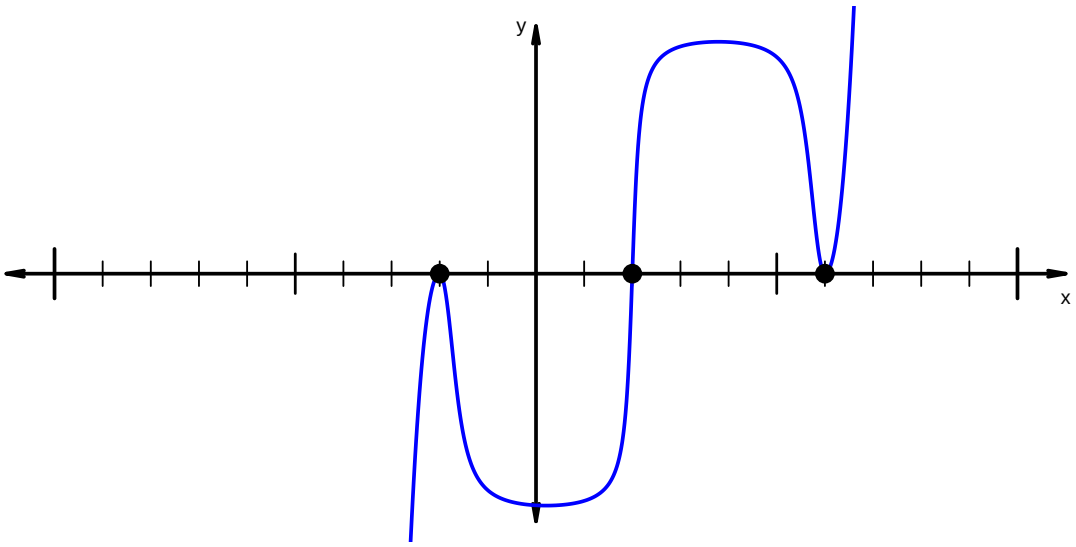
$$f(x) = (x+1)(x^2 - 9x + 20)$$

$$f(x) = (x+1)(x-4)(x-5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-2) \cdot (x-6)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 24)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 84}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-80}}{2}$$

$$x = \frac{2 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{2 \pm 4\sqrt{5}\, i}{2}$$

$$x = 1 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-6 + 3i$ and $-7 + 8i$ in standard form $(a + bi)$.**

Solution

$$(-6 + 3i) \cdot (-7 + 8i)$$

$$42 - 48i - 21i + 24i^2$$

$$42 - 48i - 21i - 24$$

$$42 - 24 - 48i - 21i$$

$$18 - 69i$$

Polynomial Factoring solution (version 24)

3. **Write function $f(x) = x^3 + 3x^2 - 16x + 12$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	3	-16	12
1		1	4	-12
	1	4	-12	0

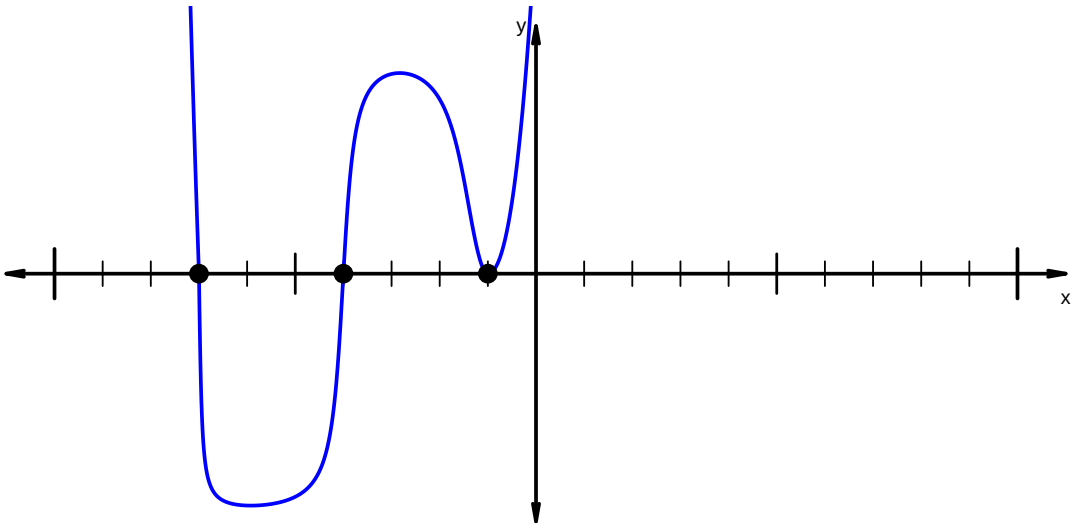
$$f(x) = (x-1)(x^2+4x-12)$$

$$f(x) = (x-1)(x-2)(x+6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)\cdot(x+4)\cdot(x+1)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 25)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 54 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(54)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 216}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-72}}{2}$$

$$x = \frac{12 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{12 \pm 6\sqrt{2}\, i}{2}$$

$$x = 6 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 + 2i$ and $3 - 4i$ in standard form $(a + bi)$.**

Solution

$$(9 + 2i) \cdot (3 - 4i)$$

$$27 - 36i + 6i - 8i^2$$

$$27 - 36i + 6i + 8$$

$$27 + 8 - 36i + 6i$$

$$35 - 30i$$

Polynomial Factoring solution (version 25)

3. **Write function $f(x) = x^3 - x^2 - 14x + 24$ in factored form. I'll give you a hint: one factor is $(x - 2)$.**

Solution

	1	-1	-14	24
2		2	2	-24
	1	1	-12	0

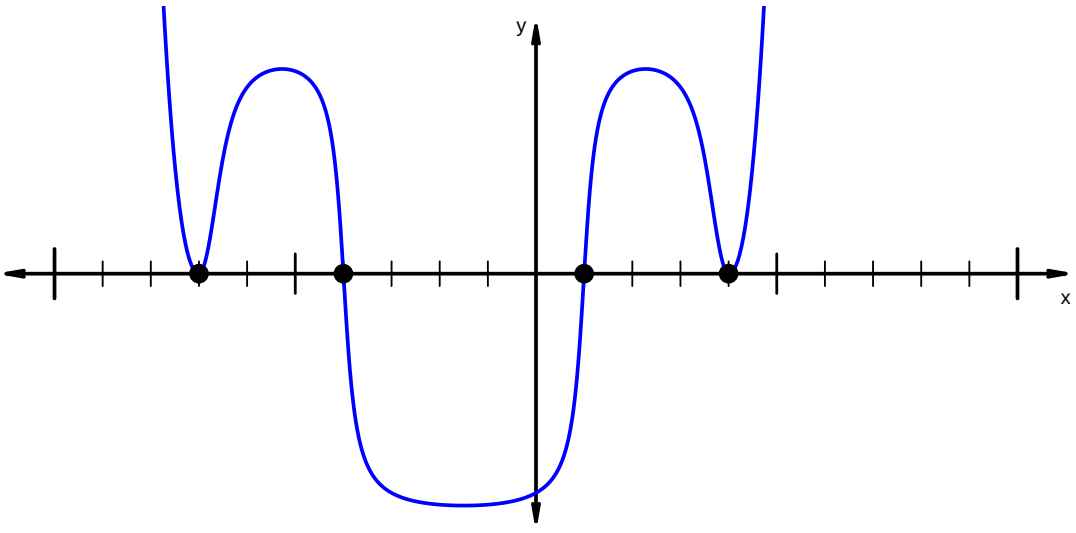
$$f(x) = (x-2)(x^2 + x - 12)$$

$$f(x) = (x-2)(x+4)(x-3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+4) \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 26)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 25 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(25)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 100}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-96}}{2}$$

$$x = \frac{2 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{2 \pm 4\sqrt{6}\, i}{2}$$

$$x = 1 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 + 5i$ and $7 + 6i$ in standard form $(a + bi)$.**

Solution

$$(-3 + 5i) \cdot (7 + 6i)$$

$$-21 - 18i + 35i + 30i^2$$

$$-21 - 18i + 35i - 30$$

$$-21 - 30 - 18i + 35i$$

$$-51 + 17i$$

Polynomial Factoring solution (version 26)

3. **Write function $f(x) = x^3 - 3x^2 - 18x + 40$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	-3	-18	40
-4		-4	28	-40
	1	-7	10	0

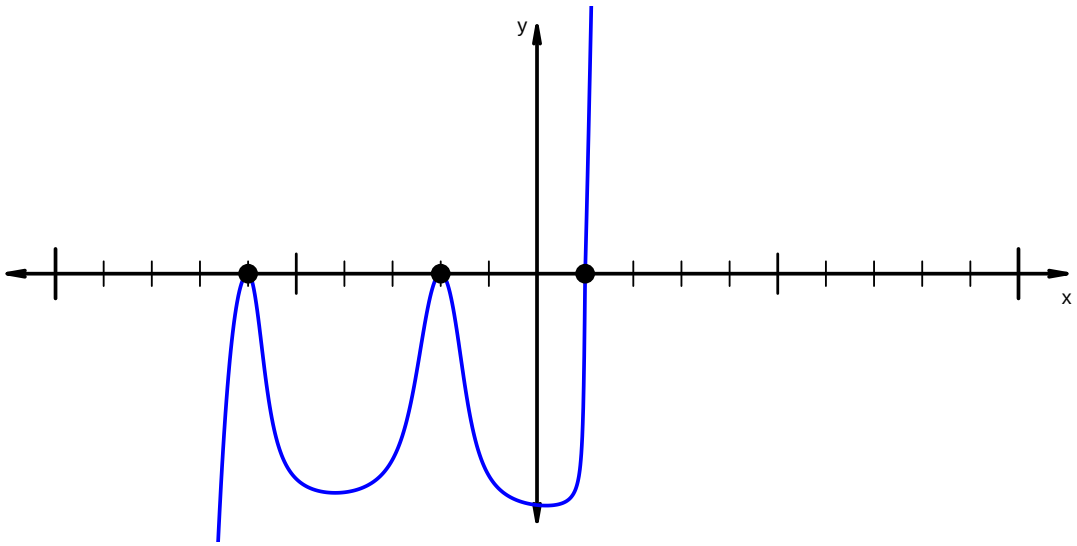
$$f(x) = (x+4)(x^2 - 7x + 10)$$

$$f(x) = (x+4)(x-5)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+6)^2 \cdot (x+2)^2 \cdot (x-1)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 27)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 54 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(54)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 216}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-72}}{2}$$

$$x = \frac{-12 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-12 \pm 6\sqrt{2}\,i}{2}$$

$$x = -6 \pm 3\sqrt{2}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 - 9i$ and $6 + 4i$ in standard form ($a + bi$).**

Solution

$$(-2 - 9i) \cdot (6 + 4i)$$

$$-12 - 8i - 54i - 36i^2$$

$$-12 - 8i - 54i + 36$$

$$-12 + 36 - 8i - 54i$$

$$24 - 62i$$

Polynomial Factoring solution (version 27)

3. **Write function $f(x) = x^3 - 2x^2 - 36x + 72$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	-2	-36	72
-6		-6	48	-72
	1	-8	12	0

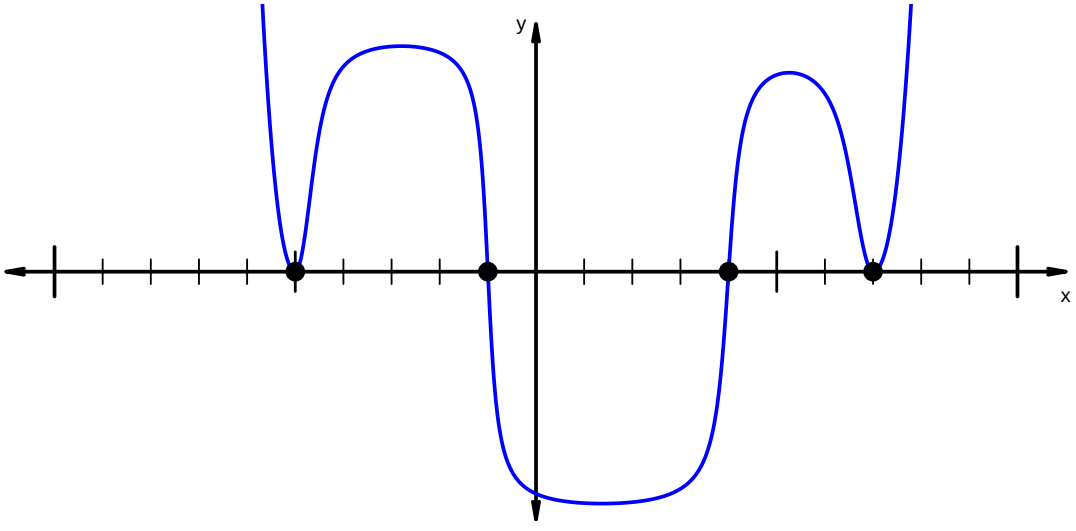
$$f(x) = (x+6)(x^2 - 8x + 12)$$

$$f(x) = (x+6)(x-6)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)^2 \cdot (x+1) \cdot (x-4) \cdot (x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 28)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 54 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(54)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 216}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-72}}{2}$$

$$x = \frac{-12 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-12 \pm 6\sqrt{2}\, i}{2}$$

$$x = -6 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 - 9i$ and $-3 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-2 - 9i) \cdot (-3 - 6i)$$

$$6 + 12i + 27i + 54i^2$$

$$6 + 12i + 27i - 54$$

$$6 - 54 + 12i + 27i$$

$$-48 + 39i$$

Polynomial Factoring solution (version 28)

3. **Write function $f(x) = x^3 - 10x^2 + 31x - 30$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	-10	31	-30
3		3	-21	30
	1	-7	10	0

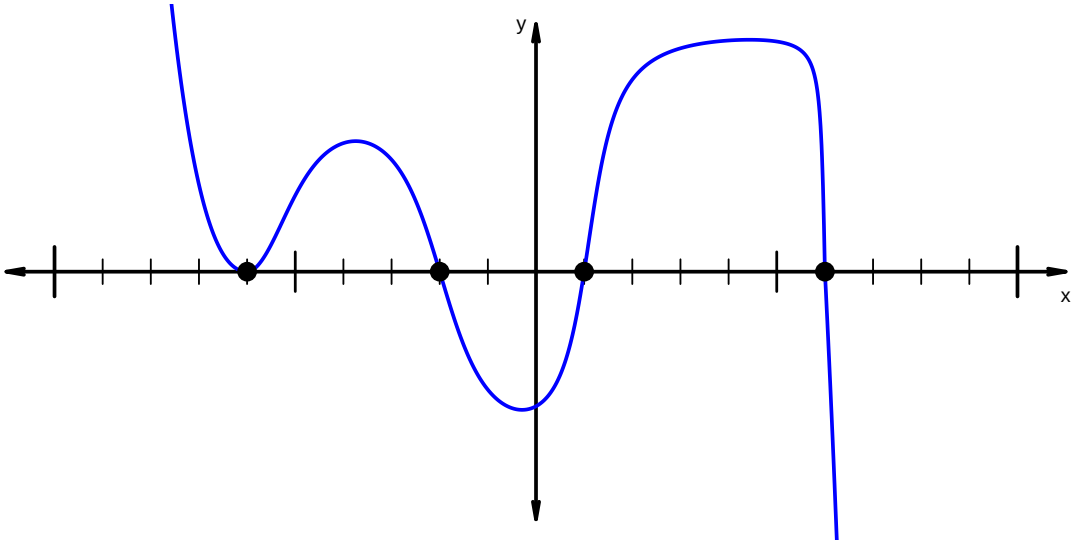
$$f(x) = (x-3)(x^2 - 7x + 10)$$

$$f(x) = (x-3)(x-5)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+6)^2 \cdot (x+2) \cdot (x-1) \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 29)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 112}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-108}}{2}$$

$$x = \frac{2 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{2 \pm 6\sqrt{3}\, i}{2}$$

$$x = 1 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 - 8i$ and $-2 + 4i$ in standard form $(a + bi)$.**

Solution

$$(-3 - 8i) \cdot (-2 + 4i)$$

$$6 - 12i + 16i - 32i^2$$

$$6 - 12i + 16i + 32$$

$$6 + 32 - 12i + 16i$$

$$38 + 4i$$

Polynomial Factoring solution (version 29)

3. **Write function $f(x) = x^3 + 5x^2 - 18x - 72$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	5	-18	-72
4		4	36	72
	1	9	18	0

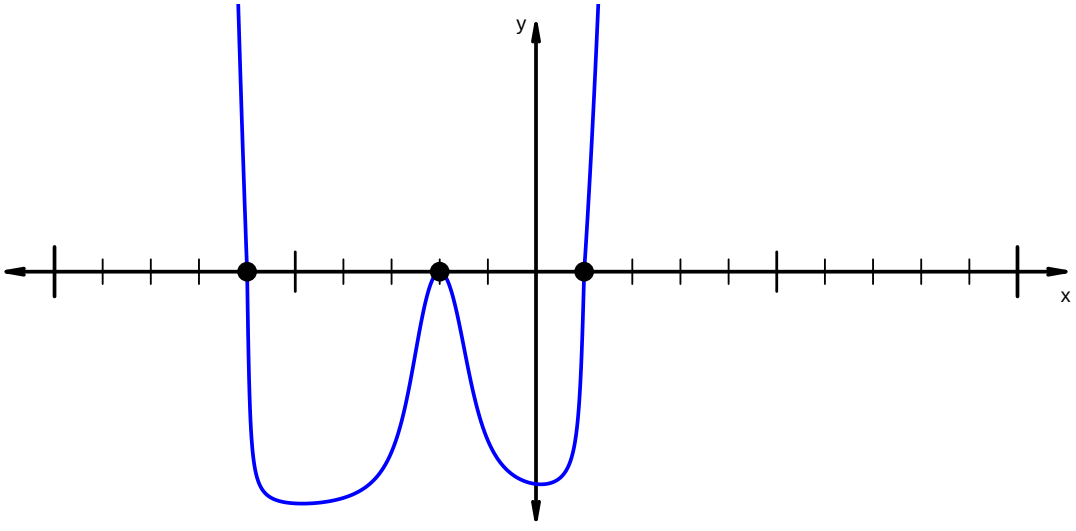
$$f(x) = (x-4)(x^2+9x+18)$$

$$f(x) = (x-4)(x+6)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+6)\cdot(x+2)^2\cdot(x-1)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 30)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 43 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(43)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 172}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-108}}{2}$$

$$x = \frac{8 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{8 \pm 6\sqrt{3}\, i}{2}$$

$$x = 4 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-7 + 6i$ and $-5 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-7 + 6i) \cdot (-5 + 3i)$$

$$35 - 21i - 30i + 18i^2$$

$$35 - 21i - 30i - 18$$

$$35 - 18 - 21i - 30i$$

$$17 - 51i$$

Polynomial Factoring solution (version 30)

3. **Write function $f(x) = x^3 + 13x^2 + 54x + 72$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	13	54	72
-4		-4	-36	-72
	1	9	18	0

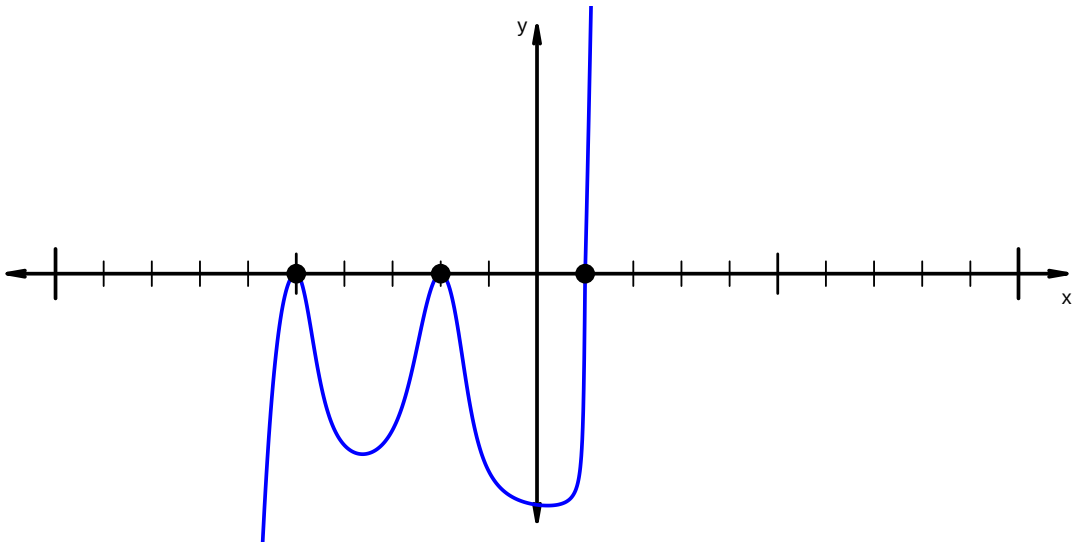
$$f(x) = (x + 4)(x^2 + 9x + 18)$$

$$f(x) = (x + 4)(x + 3)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 5)^2 \cdot (x + 2)^2 \cdot (x - 1)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 31)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 63 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(63)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 252}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-108}}{2}$$

$$x = \frac{12 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{12 \pm 6\sqrt{3}\, i}{2}$$

$$x = 6 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 7i$ and $8 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-2 + 7i) \cdot (8 - 6i)$$

$$-16 + 12i + 56i - 42i^2$$

$$-16 + 12i + 56i + 42$$

$$-16 + 42 + 12i + 56i$$

$$26 + 68i$$

Polynomial Factoring solution (version 31)

3. **Write function $f(x) = x^3 - 6x^2 - x + 6$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	-6	-1	6
1		1	-5	-6
	1	-5	-6	0

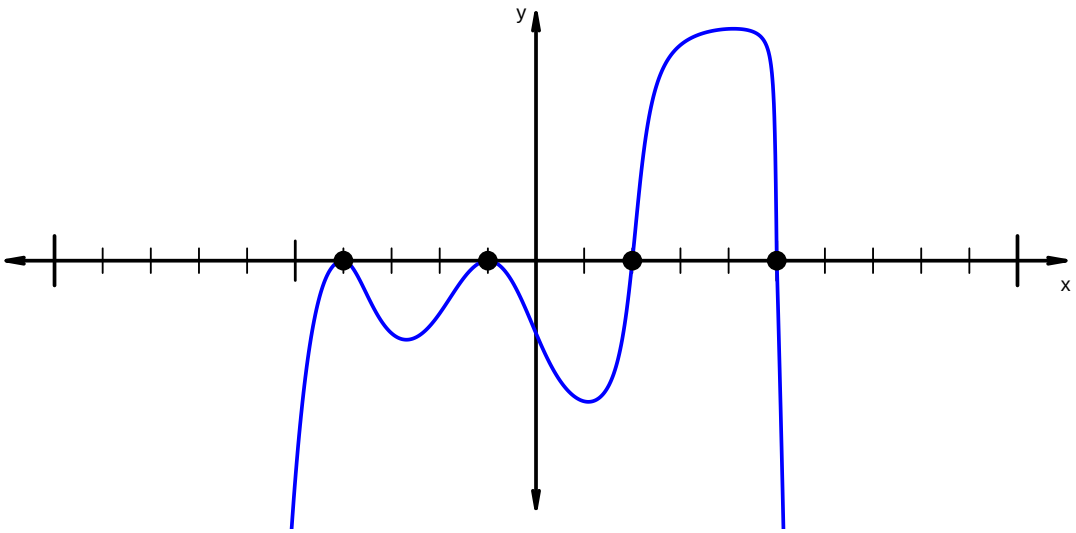
$$f(x) = (x-1)(x^2 - 5x - 6)$$

$$f(x) = (x-1)(x-6)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x+1)^2 \cdot (x-2) \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 32)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 25 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(25)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 100}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-96}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{6}\, i}{2}$$

$$x = -1 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 - 3i$ and $2 - 4i$ in standard form $(a + bi)$.**

Solution

$$(-8 - 3i) \cdot (2 - 4i)$$

$$-16 + 32i - 6i + 12i^2$$

$$-16 + 32i - 6i - 12$$

$$-16 - 12 + 32i - 6i$$

$$-28 + 26i$$

Polynomial Factoring solution (version 32)

3. **Write function $f(x) = x^3 - 3x^2 - 16x - 12$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-3	-16	-12
6		6	18	12
	1	3	2	0

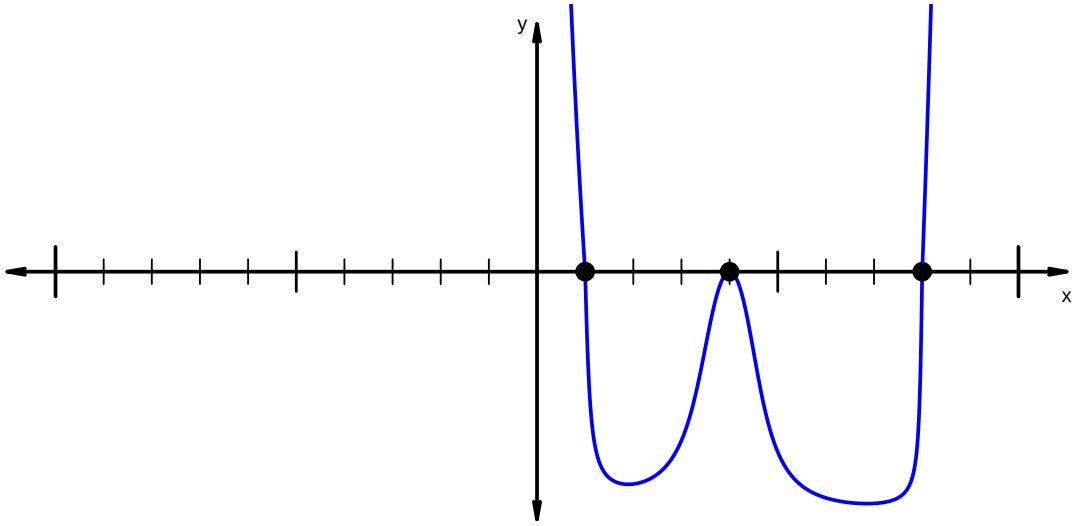
$$f(x) = (x-6)(x^2+3x+2)$$

$$f(x) = (x-6)(x+1)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x-1)\cdot(x-4)^2\cdot(x-8)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 33)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 48 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(48)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 192}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-48}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{12 \pm 4\sqrt{3}\,i}{2}$$

$$x = 6 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 + 5i$ and $-2 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-9 + 5i) \cdot (-2 - 6i)$$

$$18 + 54i - 10i - 30i^2$$

$$18 + 54i - 10i + 30$$

$$18 + 30 + 54i - 10i$$

$$48 + 44i$$

Polynomial Factoring solution (version 33)

3. **Write function $f(x) = x^3 + 2x^2 - 19x - 20$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	2	-19	-20
4		4	24	20
	1	6	5	0

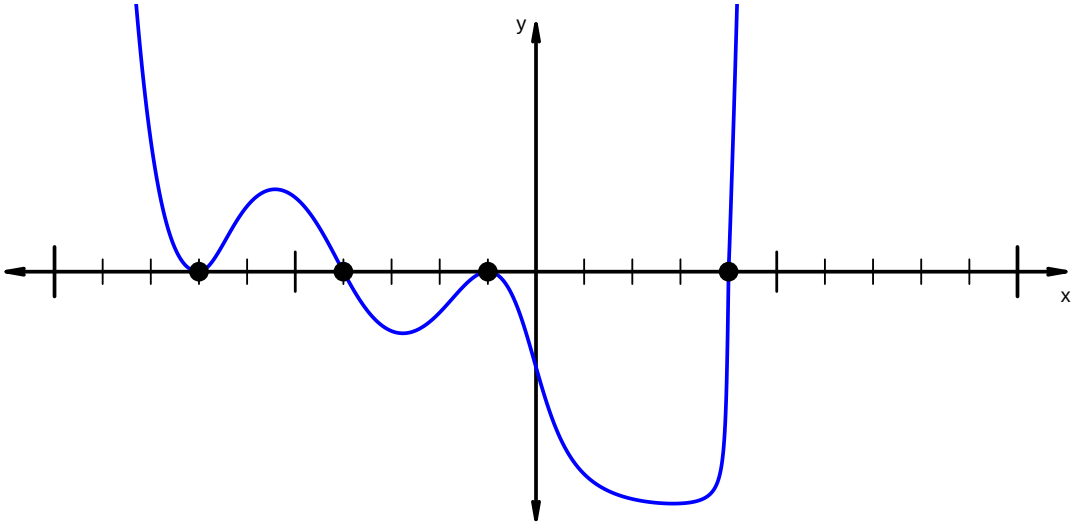
$$f(x) = (x-4)(x^2+6x+5)$$

$$f(x) = (x-4)(x+1)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+4) \cdot (x+1)^2 \cdot (x-4)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 34)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 18 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(18)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 72}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-8}}{2}$$

$$x = \frac{-8 \pm \sqrt{-4 \cdot 2}}{2}$$

$$x = \frac{-8 \pm 2\sqrt{2}\, i}{2}$$

$$x = -4 \pm \sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 + 4i$ and $-5 + 2i$ in standard form $(a + bi)$.**

Solution

$$(-8 + 4i) \cdot (-5 + 2i)$$

$$40 - 16i - 20i + 8i^2$$

$$40 - 16i - 20i - 8$$

$$40 - 8 - 16i - 20i$$

$$32 - 36i$$

Polynomial Factoring solution (version 34)

3. **Write function $f(x) = x^3 - 4x^2 - 27x + 90$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-4	-27	90
6		6	12	-90
	1	2	-15	0

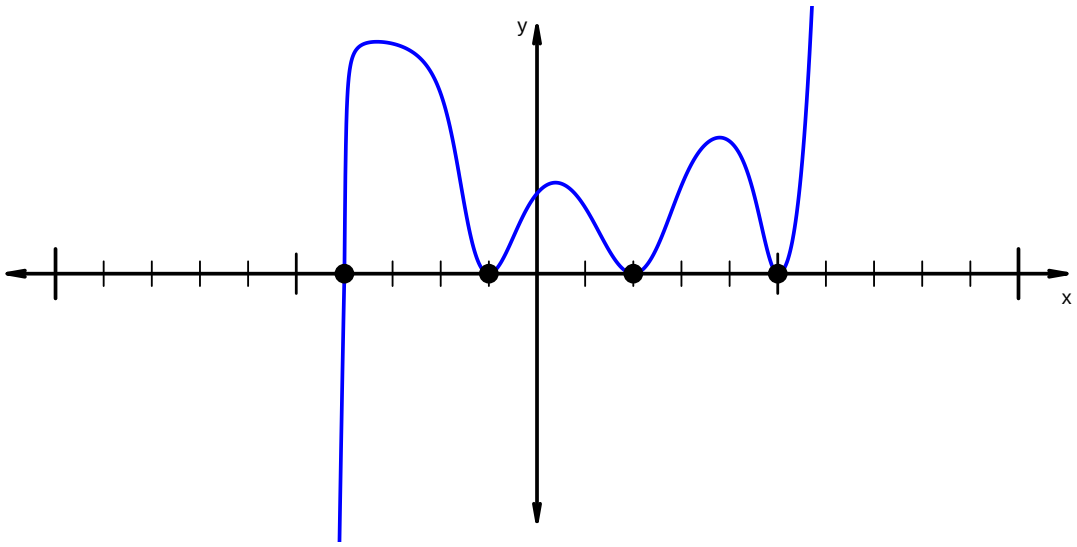
$$f(x) = (x-6)(x^2+2x-15)$$

$$f(x) = (x-6)(x-3)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+4)\cdot(x+1)^2\cdot(x-2)^2\cdot(x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 35)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 7 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(7)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 28}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-12}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4 \cdot 3}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{3}\, i}{2}$$

$$x = -2 \pm \sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 - 2i$ and $-3 - 8i$ in standard form $(a + bi)$.**

Solution

$$(-9 - 2i) \cdot (-3 - 8i)$$

$$27 + 72i + 6i + 16i^2$$

$$27 + 72i + 6i - 16$$

$$27 - 16 + 72i + 6i$$

$$11 + 78i$$

Polynomial Factoring solution (version 35)

3. **Write function $f(x) = x^3 + 7x^2 + 14x + 8$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	7	14	8
-4		-4	-12	-8
	1	3	2	0

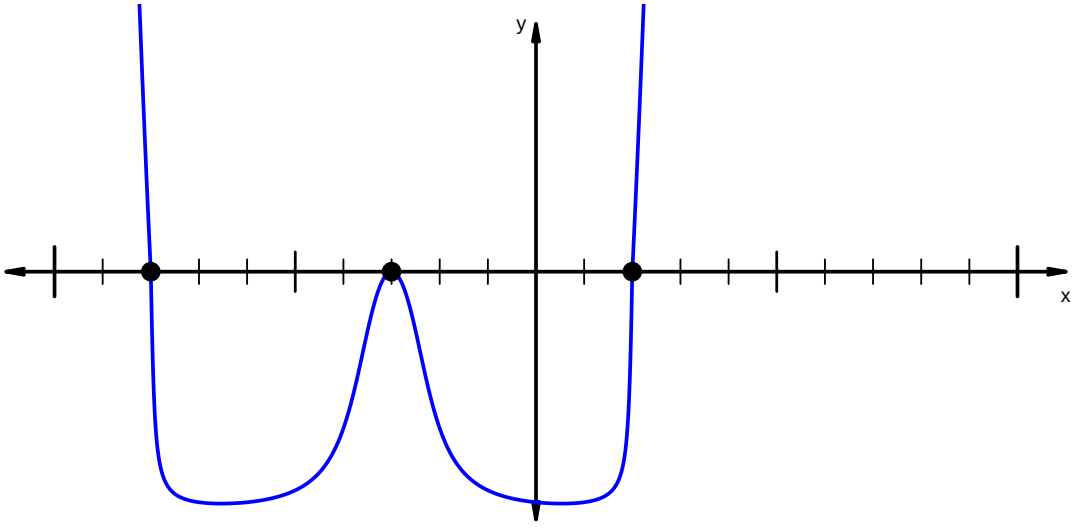
$$f(x) = (x + 4)(x^2 + 3x + 2)$$

$$f(x) = (x + 4)(x + 2)(x + 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 8) \cdot (x + 3)^2 \cdot (x - 2)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 36)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 96}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-80}}{2}$$

$$x = \frac{-4 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-4 \pm 4\sqrt{5}\, i}{2}$$

$$x = -2 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-5 - 2i$ and $-3 - 9i$ in standard form $(a + bi)$.**

Solution

$$(-5 - 2i) \cdot (-3 - 9i)$$

$$15 + 45i + 6i + 18i^2$$

$$15 + 45i + 6i - 18$$

$$15 - 18 + 45i + 6i$$

$$-3 + 51i$$

Polynomial Factoring solution (version 36)

3. **Write function $f(x) = x^3 - 9x^2 + 8x + 60$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-9	8	60
6		6	-18	-60
	1	-3	-10	0

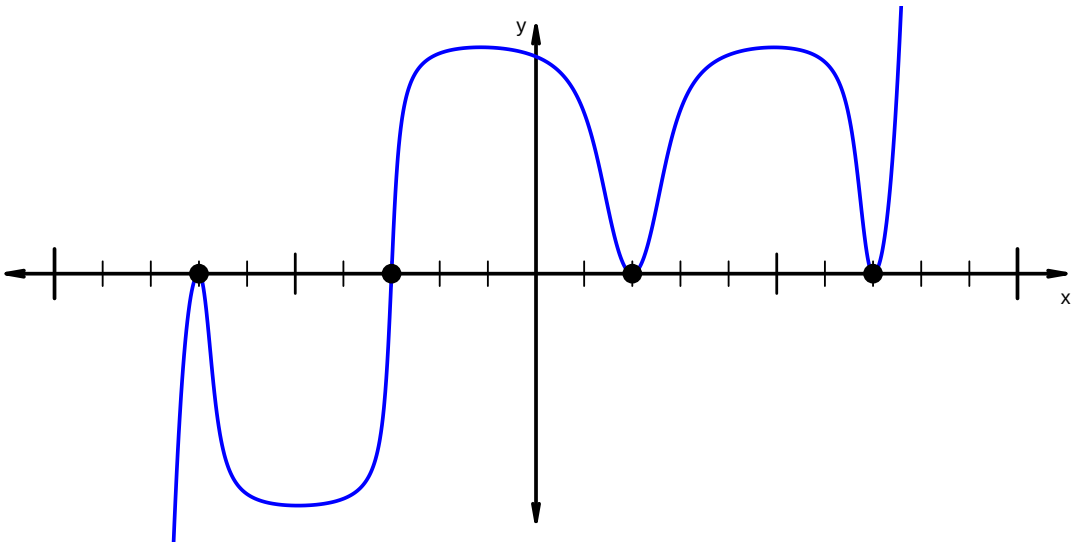
$$f(x) = (x-6)(x^2-3x-10)$$

$$f(x) = (x-6)(x-5)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+3) \cdot (x-2)^2 \cdot (x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 37)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 84}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-48}}{2}$$

$$x = \frac{-6 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{-6 \pm 4\sqrt{3}\,i}{2}$$

$$x = -3 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $8 - 5i$ and $-4 + 2i$ in standard form $(a + bi)$.**

Solution

$$(8 - 5i) \cdot (-4 + 2i)$$

$$-32 + 16i + 20i - 10i^2$$

$$-32 + 16i + 20i + 10$$

$$-32 + 10 + 16i + 20i$$

$$-22 + 36i$$

Polynomial Factoring solution (version 37)

3. **Write function $f(x) = x^3 + x^2 - 30x - 72$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	1	-30	-72
-3		-3	6	72
	1	-2	-24	0

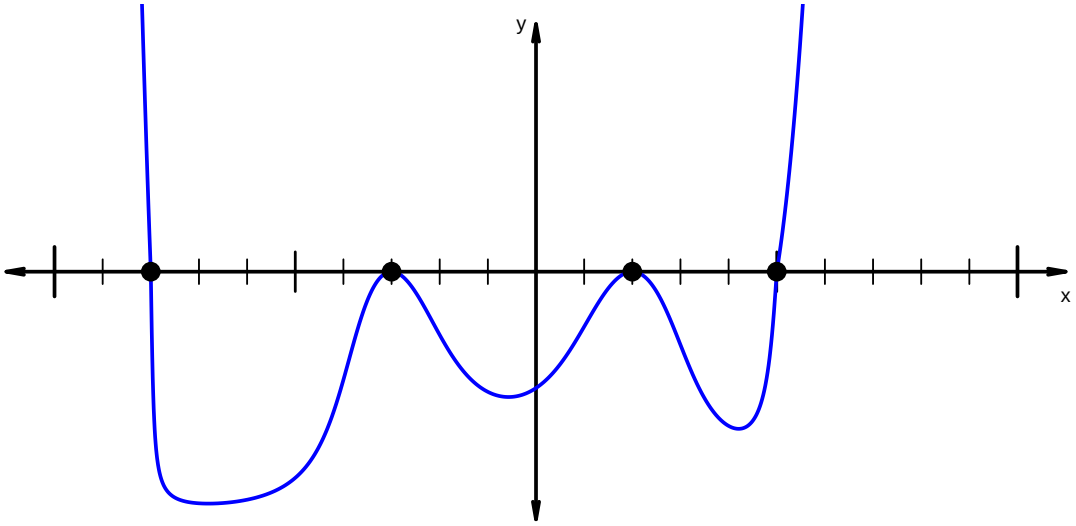
$$f(x) = (x+3)(x^2 - 2x - 24)$$

$$f(x) = (x+3)(x+4)(x-6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+8) \cdot (x+3)^2 \cdot (x-2)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 38)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 112}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-96}}{2}$$

$$x = \frac{-4 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-4 \pm 4\sqrt{6}\, i}{2}$$

$$x = -2 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 + 8i$ and $-2 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-9 + 8i) \cdot (-2 - 6i)$$

$$18 + 54i - 16i - 48i^2$$

$$18 + 54i - 16i + 48$$

$$18 + 48 + 54i - 16i$$

$$66 + 38i$$

Polynomial Factoring solution (version 38)

3. **Write function $f(x) = x^3 - 8x^2 + 17x - 10$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	-8	17	-10
5		5	-15	10
	1	-3	2	0

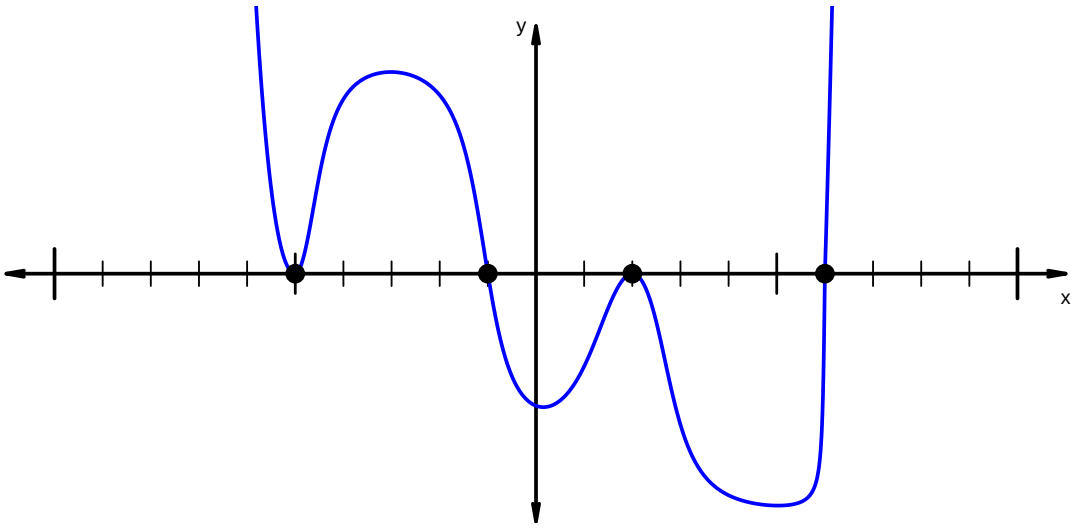
$$f(x) = (x-5)(x^2 - 3x + 2)$$

$$f(x) = (x-5)(x-1)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)^2 \cdot (x+1) \cdot (x-2)^2 \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 39)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 63 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(63)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 252}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-108}}{2}$$

$$x = \frac{12 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{12 \pm 6\sqrt{3}\, i}{2}$$

$$x = 6 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 3i$ and $-6 - 2i$ in standard form $(a + bi)$.**

Solution

$$(7 + 3i) \cdot (-6 - 2i)$$

$$-42 - 14i - 18i - 6i^2$$

$$-42 - 14i - 18i + 6$$

$$-42 + 6 - 14i - 18i$$

$$-36 - 32i$$

Polynomial Factoring solution (version 39)

3. **Write function $f(x) = x^3 - 4x^2 - 20x + 48$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	-4	-20	48
-4		-4	32	-48
	1	-8	12	0

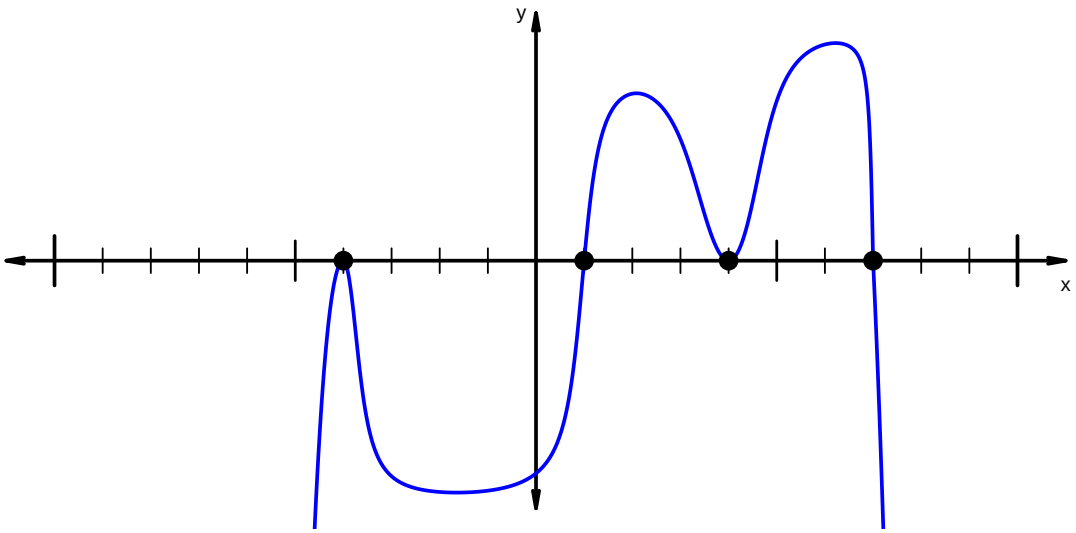
$$f(x) = (x+4)(x^2 - 8x + 12)$$

$$f(x) = (x+4)(x-6)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x-1) \cdot (x-4)^2 \cdot (x-7)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 40)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 13 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(13)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 52}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-48}}{2}$$

$$x = \frac{2 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{2 \pm 4\sqrt{3}\,i}{2}$$

$$x = 1 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-4 + 3i$ and $6 - 7i$ in standard form $(a + bi)$.**

Solution

$$(-4 + 3i) \cdot (6 - 7i)$$

$$-24 + 28i + 18i - 21i^2$$

$$-24 + 28i + 18i + 21$$

$$-24 + 21 + 28i + 18i$$

$$-3 + 46i$$

Polynomial Factoring solution (version 40)

3. **Write function $f(x) = x^3 - 4x^2 - 4x + 16$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	-4	-4	16
-2		-2	12	-16
	1	-6	8	0

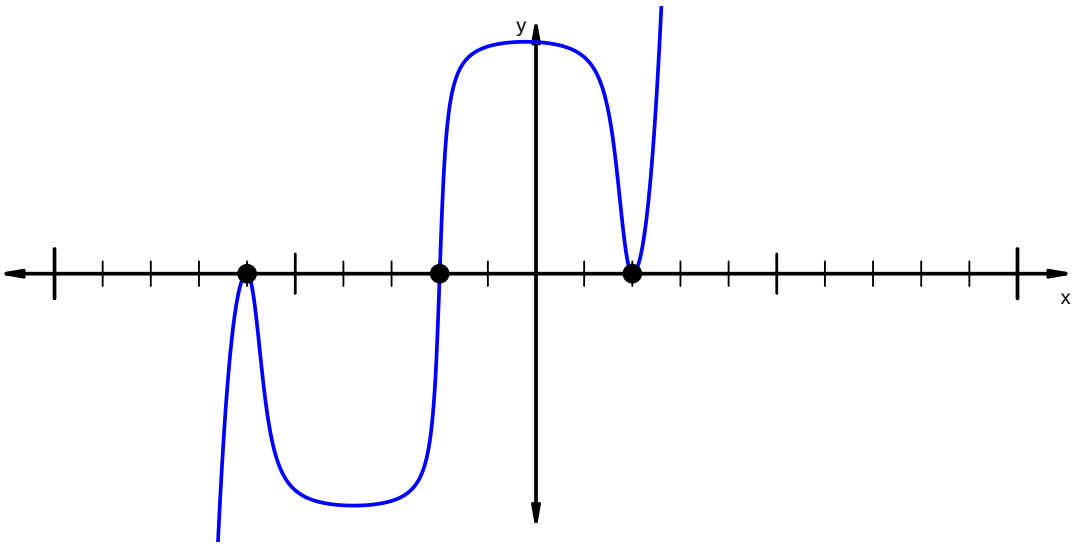
$$f(x) = (x + 2)(x^2 - 6x + 8)$$

$$f(x) = (x + 2)(x - 2)(x - 4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 6)^2 \cdot (x + 2) \cdot (x - 2)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 41)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 11 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(11)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 44}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-28}}{2}$$

$$x = \frac{4 \pm \sqrt{-4 \cdot 7}}{2}$$

$$x = \frac{4 \pm 2\sqrt{7}\, i}{2}$$

$$x = 2 \pm \sqrt{7}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 + 7i$ and $3 + 6i$ in standard form $(a + bi)$.**

Solution

$$(9 + 7i) \cdot (3 + 6i)$$

$$27 + 54i + 21i + 42i^2$$

$$27 + 54i + 21i - 42$$

$$27 - 42 + 54i + 21i$$

$$-15 + 75i$$

Polynomial Factoring solution (version 41)

3. **Write function $f(x) = x^3 + x^2 - 25x - 25$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	1	-25	-25
5		5	30	25
	1	6	5	0

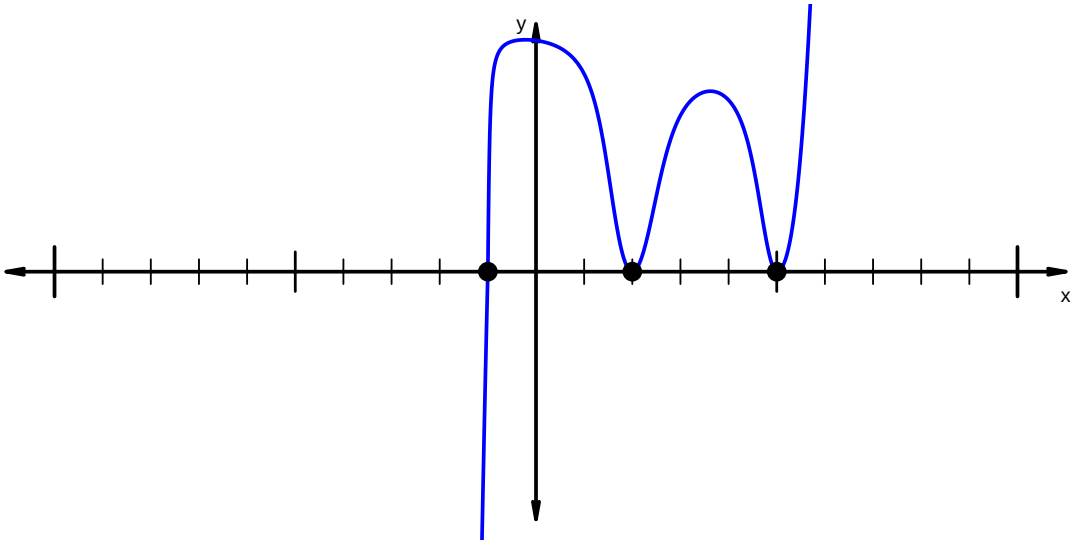
$$f(x) = (x-5)(x^2+6x+5)$$

$$f(x) = (x-5)(x+1)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+1)\cdot(x-2)^2\cdot(x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 42)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 38 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(38)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 152}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-8}}{2}$$

$$x = \frac{-12 \pm \sqrt{-4 \cdot 2}}{2}$$

$$x = \frac{-12 \pm 2\sqrt{2}\, i}{2}$$

$$x = -6 \pm \sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 3i$ and $5 - 8i$ in standard form $(a + bi)$.**

Solution

$$(2 - 3i) \cdot (5 - 8i)$$

$$10 - 16i - 15i + 24i^2$$

$$10 - 16i - 15i - 24$$

$$10 - 24 - 16i - 15i$$

$$-14 - 31i$$

Polynomial Factoring solution (version 42)

3. **Write function $f(x) = x^3 + 2x^2 - 9x - 18$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	2	-9	-18
3		3	15	18
	1	5	6	0

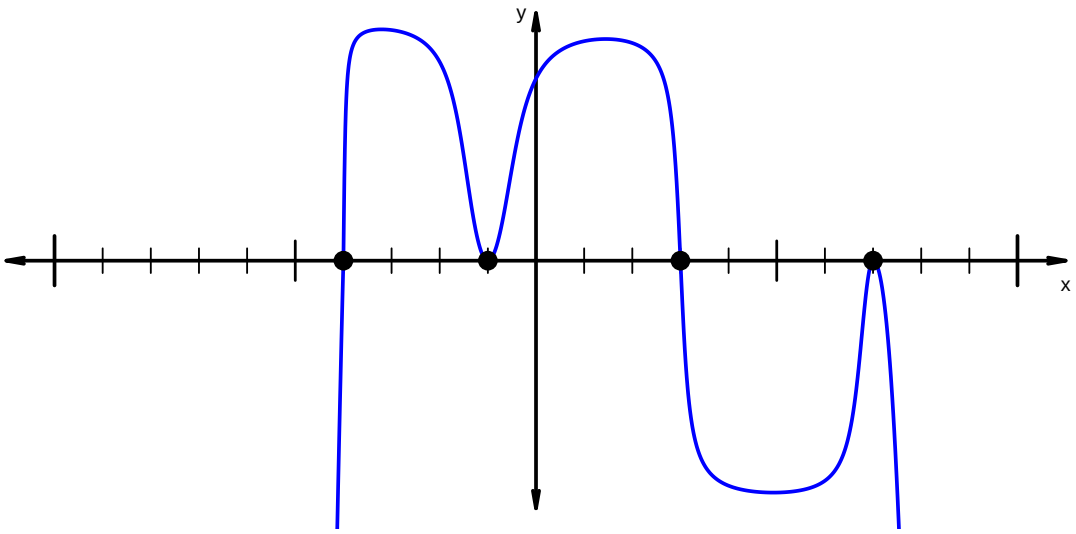
$$f(x) = (x-3)(x^2+5x+6)$$

$$f(x) = (x-3)(x+2)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)\cdot(x+1)^2\cdot(x-3)\cdot(x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 43)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 42 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(42)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 168}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-24}}{2}$$

$$x = \frac{12 \pm \sqrt{-4 \cdot 6}}{2}$$

$$x = \frac{12 \pm 2\sqrt{6}\, i}{2}$$

$$x = 6 \pm \sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 3i$ and $-9 - 8i$ in standard form $(a + bi)$.**

Solution

$$(6 + 3i) \cdot (-9 - 8i)$$

$$-54 - 48i - 27i - 24i^2$$

$$-54 - 48i - 27i + 24$$

$$-54 + 24 - 48i - 27i$$

$$-30 - 75i$$

Polynomial Factoring solution (version 43)

3. **Write function $f(x) = x^3 + 5x^2 - x - 5$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	5	-1	-5
1		1	6	5
	1	6	5	0

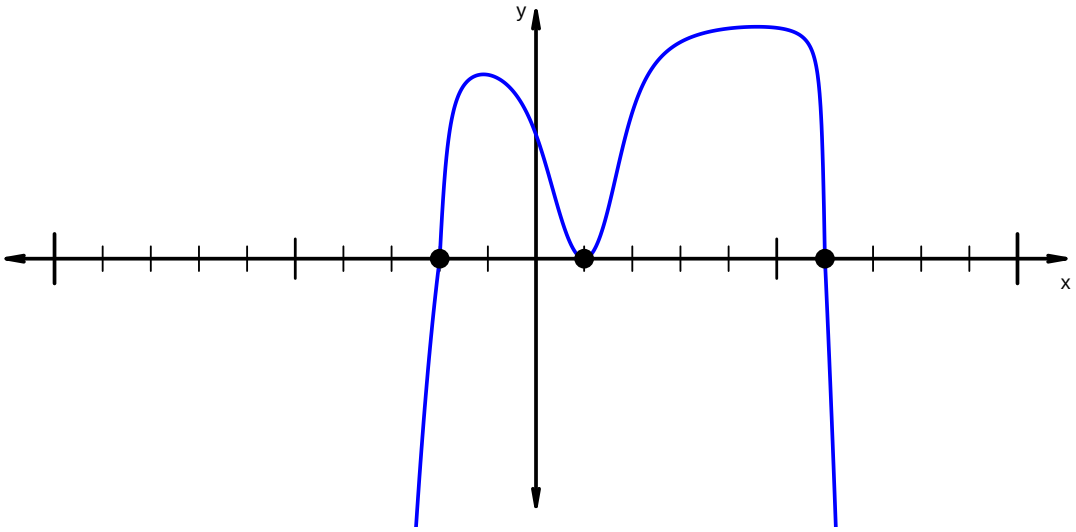
$$f(x) = (x-1)(x^2+6x+5)$$

$$f(x) = (x-1)(x+5)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+2)\cdot(x-1)^2\cdot(x-6)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 44)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 63 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(63)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 252}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-108}}{2}$$

$$x = \frac{-12 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{-12 \pm 6\sqrt{3}\, i}{2}$$

$$x = -6 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 6i$ and $-7 + 5i$ in standard form $(a + bi)$.**

Solution

$$(-2 + 6i) \cdot (-7 + 5i)$$

$$14 - 10i - 42i + 30i^2$$

$$14 - 10i - 42i - 30$$

$$14 - 30 - 10i - 42i$$

$$-16 - 52i$$

Polynomial Factoring solution (version 44)

3. **Write function $f(x) = x^3 + 6x^2 - 4x - 24$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	6	-4	-24
-2		-2	-8	24
	1	4	-12	0

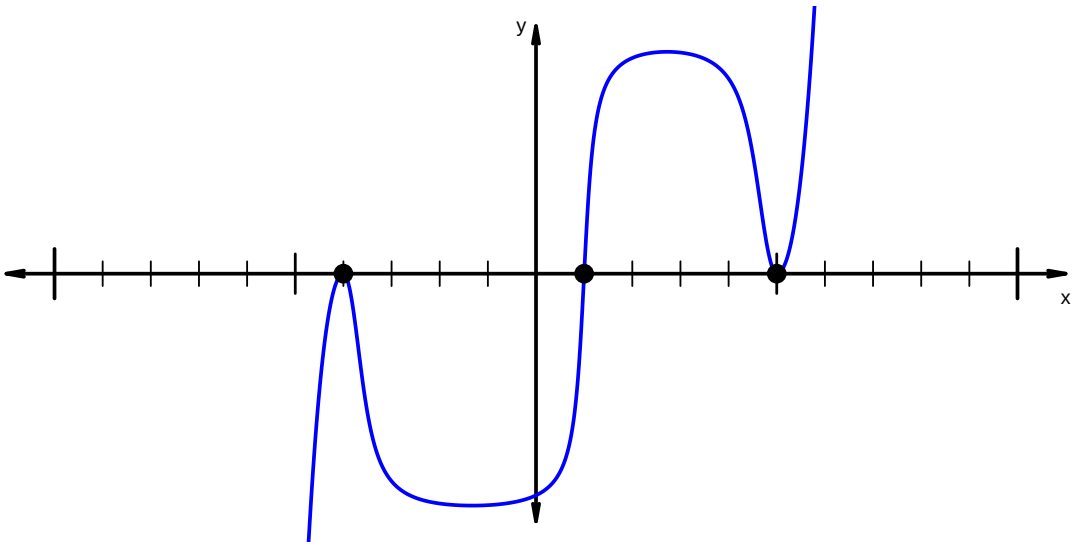
$$f(x) = (x + 2)(x^2 + 4x - 12)$$

$$f(x) = (x + 2)(x + 6)(x - 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 4)^2 \cdot (x - 1) \cdot (x - 5)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 45)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 19 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(19)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 76}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-72}}{2}$$

$$x = \frac{-2 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-2 \pm 6\sqrt{2}\, i}{2}$$

$$x = -1 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-7 + 2i$ and $-9 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-7 + 2i) \cdot (-9 + 3i)$$

$$63 - 21i - 18i + 6i^2$$

$$63 - 21i - 18i - 6$$

$$63 - 6 - 21i - 18i$$

$$57 - 39i$$

Polynomial Factoring solution (version 45)

3. **Write function $f(x) = x^3 + 6x^2 - x - 30$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	6	-1	-30
-5		-5	-5	30
	1	1	-6	0

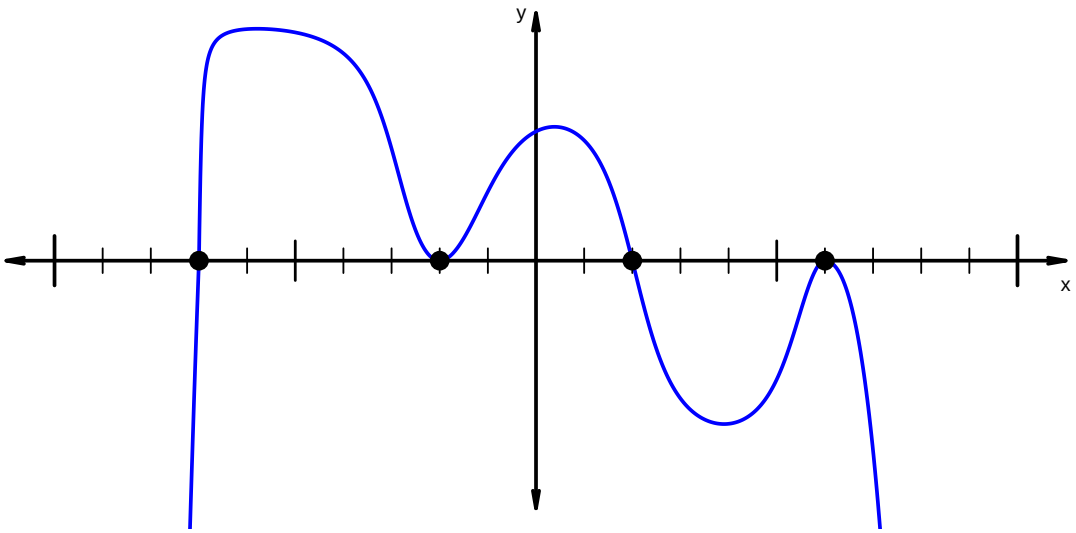
$$f(x) = (x+5)(x^2+x-6)$$

$$f(x) = (x+5)(x+3)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+7)\cdot(x+2)^2\cdot(x-2)\cdot(x-6)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 46)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 43 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(43)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 172}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-72}}{2}$$

$$x = \frac{-10 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 6\sqrt{2}\, i}{2}$$

$$x = -5 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $8 + 4i$ and $-5 + 7i$ in standard form $(a + bi)$.**

Solution

$$(8 + 4i) \cdot (-5 + 7i)$$

$$-40 + 56i - 20i + 28i^2$$

$$-40 + 56i - 20i - 28$$

$$-40 - 28 + 56i - 20i$$

$$-68 + 36i$$

Polynomial Factoring solution (version 46)

3. **Write function $f(x) = x^3 - 4x^2 - 20x + 48$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	-4	-20	48
-4		-4	32	-48
	1	-8	12	0

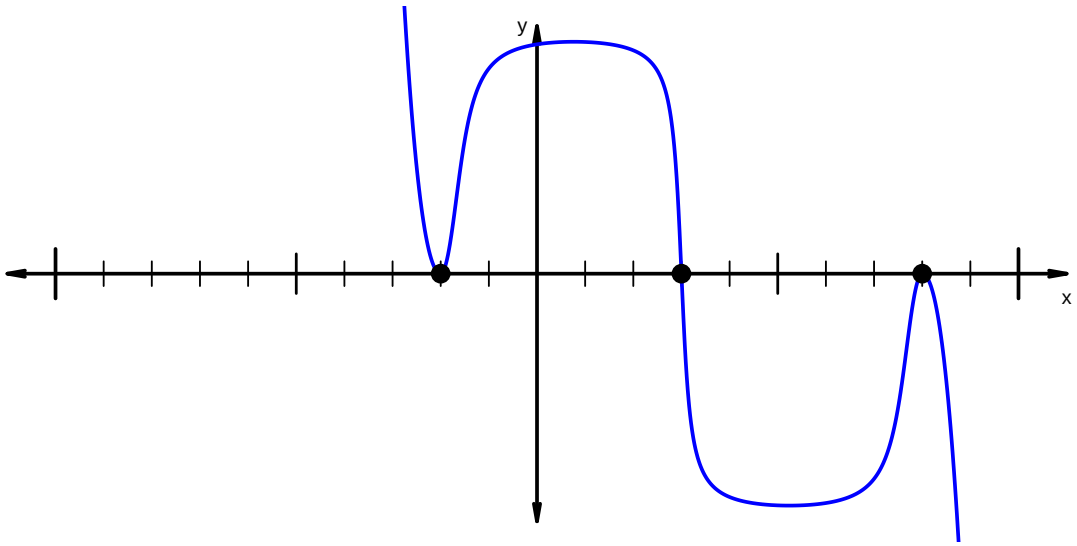
$$f(x) = (x + 4)(x^2 - 8x + 12)$$

$$f(x) = (x + 4)(x - 6)(x - 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 2)^2 \cdot (x - 3) \cdot (x - 8)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 47)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 52 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(52)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 208}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-108}}{2}$$

$$x = \frac{10 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{10 \pm 6\sqrt{3}\, i}{2}$$

$$x = 5 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 - 5i$ and $2 - 3i$ in standard form ($a + bi$).**

Solution

$$(-8 - 5i) \cdot (2 - 3i)$$
$$-16 + 24i - 10i + 15i^2$$
$$-16 + 24i - 10i - 15$$
$$-16 - 15 + 24i - 10i$$
$$-31 + 14i$$

Polynomial Factoring solution (version 47)

3. **Write function $f(x) = x^3 - 7x^2 + 4x + 12$ in factored form. I'll give you a hint: one factor is $(x + 1)$.**

Solution

	1	-7	4	12
-1		-1	8	-12
	1	-8	12	0

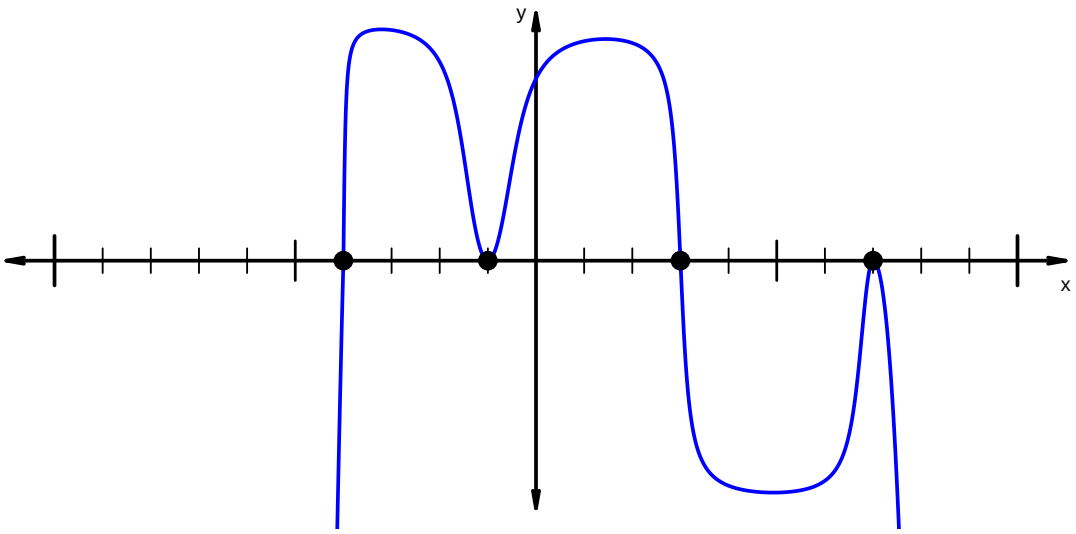
$$f(x) = (x+1)(x^2 - 8x + 12)$$

$$f(x) = (x+1)(x-6)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4) \cdot (x+1)^2 \cdot (x-3) \cdot (x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 48)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 15 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(15)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 60}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-44}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4 \cdot 11}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{11}\, i}{2}$$

$$x = -2 \pm \sqrt{11}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 + 3i$ and $4 - 5i$ in standard form $(a + bi)$.**

Solution

$$(-8 + 3i) \cdot (4 - 5i)$$

$$-32 + 40i + 12i - 15i^2$$

$$-32 + 40i + 12i + 15$$

$$-32 + 15 + 40i + 12i$$

$$-17 + 52i$$

Polynomial Factoring solution (version 48)

3. **Write function $f(x) = x^3 - 7x^2 - 6x + 72$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	-7	-6	72
-3		-3	30	-72
	1	-10	24	0

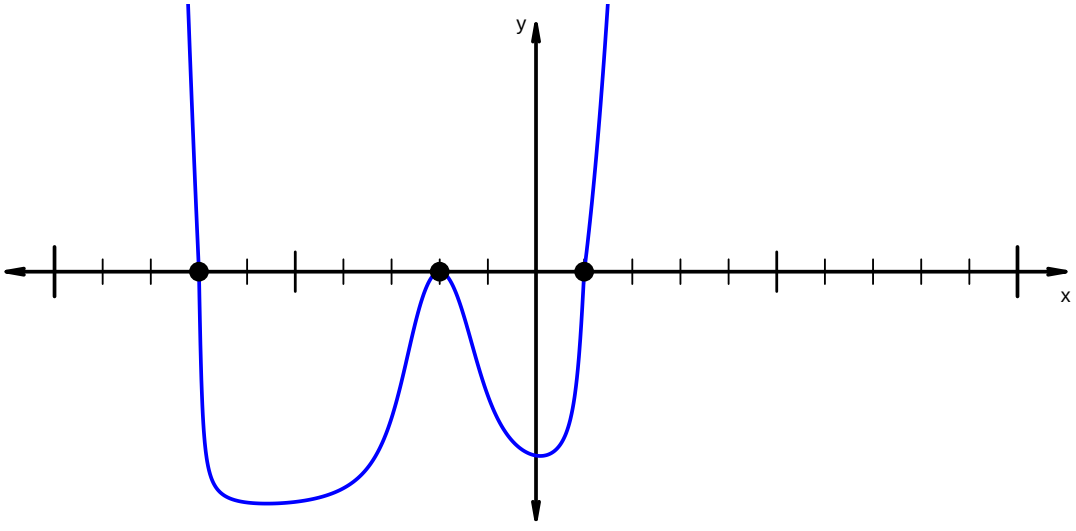
$$f(x) = (x + 3)(x^2 - 10x + 24)$$

$$f(x) = (x + 3)(x - 6)(x - 4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 7) \cdot (x + 2)^2 \cdot (x - 1)$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 49)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 34 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(34)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 136}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-72}}{2}$$

$$x = \frac{-8 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-8 \pm 6\sqrt{2}\, i}{2}$$

$$x = -4 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-5 + 4i$ and $-3 - 2i$ in standard form $(a + bi)$.**

Solution

$$(-5 + 4i) \cdot (-3 - 2i)$$

$$15 + 10i - 12i - 8i^2$$

$$15 + 10i - 12i + 8$$

$$15 + 8 + 10i - 12i$$

$$23 - 2i$$

Polynomial Factoring solution (version 49)

3. **Write function $f(x) = x^3 - 10x^2 + 27x - 18$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-10	27	-18
6		6	-24	18
	1	-4	3	0

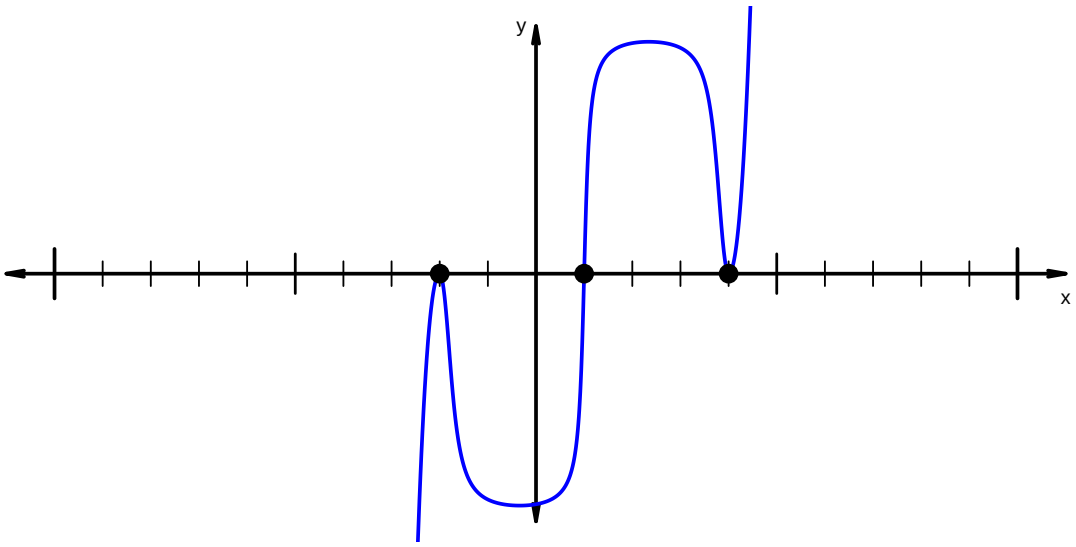
$$f(x) = (x-6)(x^2 - 4x + 3)$$

$$f(x) = (x-6)(x-1)(x-3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.



Name: Date:

Polynomial Factoring solution (version 50)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 52 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(52)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 208}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-108}}{2}$$

$$x = \frac{10 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{10 \pm 6\sqrt{3}\, i}{2}$$

$$x = 5 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 8i$ and $-4 - 5i$ in standard form $(a + bi)$.**

Solution

$$(7 + 8i) \cdot (-4 - 5i)$$

$$-28 - 35i - 32i - 40i^2$$

$$-28 - 35i - 32i + 40$$

$$-28 + 40 - 35i - 32i$$

$$12 - 67i$$

Polynomial Factoring solution (version 50)

3. **Write function $f(x) = x^3 + 10x^2 + 19x - 30$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	10	19	-30
-5		-5	-25	30
	1	5	-6	0

$$f(x) = (x + 5)(x^2 + 5x - 6)$$

$$f(x) = (x + 5)(x - 1)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 2)^2 \cdot (x - 3) \cdot (x - 8)$$

Sketch a graph of polynomial $y = p(x)$.